

TECHNIQUES OF TEACHING TYPEWRITING

Second Edition

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TECHNIQUES OF TEACHING TYPEWRITING, SECOND EDITION

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Preface

THIS book undertakes to deal in a concrete and practical way with the underlying principles of typewriting instruction. It is intended as a textbook for students training to become teachers of typewriting, and for private study by teachers already in the teaching field. It is also hoped that teachers of other subjects may find in it some help in meeting their educational problems.

The teacher of typewriting needs to be very sure of himself. He must know how, as well as what, to teach. There is no substitute for a mastery of the technique of the teaching process, but this ready command of teaching methods is in no sense an equivalent of the consciousness of having been "born a teacher." The two must go hand in hand; hence the necessity for special courses in methods for each subject taught.

In selecting materials for this book, the author is so greatly indebted that it is not possible to name each source of information—in fact, there is no wish to take the credit for all the ideas set forth. The endeavor has been to gather together the "cream" of every book and magazine article that has been written on the subject of the technique of teaching typewriting, and to join the material together in the light of personal knowledge and experience. The one underlying purpose is to give to teachers and prospective teachers of typewriting the best methods the profession affords, and thus furnish an opportunity to make more effective their ideals of instruction.

The author feels indebted to Harold H. Smith for his advice and help in the preparation of the material in this book and wishes here to acknowledge it gratefully.

JANE E. CLEM

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The Typewriting Teacher

The Responsibility of the Teacher The typewriting teacher will be training young people who are learning to apply the skill of typewriting to their own use at home, in high school, in college—in fact to any use where greater legibility and speed will aid them in the production of written matter. The typewriting teacher will be training many young people who are going into business or business teacher training. This places a great responsibility on the teacher not only to impart a knowledge of the subject, but also to inspire and direct the students toward the attainment of the highest skill of which they are capable.

The many different conditions of students' home life, their previous training, and their willingness to learn represent some of the many situations with which the teacher must contend. If the teaching has been effective, students will show evidence that they have assimilated ideas, have developed new concepts as a result of their own thinking and have learned to apply their typewriting skill to the production of business and personal forms.

Types of Teachers To be a good teacher is a high achievement. School buildings and equipment are easily obtained, but the great achievement is to secure *good teachers*, teachers of power and devotion, who know the art of teaching and can impress their students.

There are three types of teachers, but only two types are remembered: one, to be forgiven after years have softened the resentments; another, to be thought of with honor and gratitude. Between these two is a third and a larger group—those who are forgotten because they failed to make a lasting impression on their students. This group represents the mediocrity of the profession—not bad enough to merit resentment, not good enough to claim a place in gratitude and remembrance.

When we think back to our own student days, the impressions that cling to our memories are not chiefly impressions of facts taught and of lessons learned, but rather of the personality of the teacher. Many of the truths presented and most of the conclusions drawn may have been forgotten, but the warmth of the human touch still remains. This does not mean that the subject matter taught is unimportant nor that the lessons presented are immaterial, but only that life responds first of all to life. The student does not obtain knowledge disembodied and detached, but always with the slant and the quality of the teacher's interpretation of it. All that passes through the medium of a living personality takes its tone and quality from this contact.

The Background of the Teacher The teacher should never try to teach all he knows. Dr. John Dewey says that the subject matter being taught should be so well mastered that it becomes second nature to the teacher, then, when he comes to the class, the best powers of thought and insight can be given to the human element—seeking to understand the students as he teaches them. The teacher's knowledge and mastery of subject matter must always be much broader than the material he actually presents—more complete than could be achieved by the students. Only this will give the mental perspective demanded of the teacher and will enable thought to move with certainty and assurance in the field of instruction. Only this will win the confidence and respect of students who have a quick sense for a teacher's mastery of or weakness in his subject.

The successful teacher must be a student and must continually grow in knowledge and in teaching power. There is no way of becoming "prepared" and then having this preparation serve without further growth. This, then, should be the teacher's standard. A broad background of general preparation, constant reading and study in the field in which the teaching is done, special preparation for each lesson taught, and for the typewriting teacher, at least average skill in the operation of the typewriter.

Teaching is an art that must be learned just as any other art. It is often claimed that anyone who knows a thing can teach it, but often the teacher who makes such a claim is himself the best refutation of its validity when he comes before his class. Probably most of us have known specialists in their fields of learning who were but indifferent teachers. It is not that they knew too much about their subject, but that they had not mastered the art of presenting it to others.

The first requirement of the teacher is to look at himself. He must

combine in himself the qualities he seeks to develop in his students. He must look to his personality as the source of his influence and the measure of his power. He must be what he hopes his students to be come, and he should be able to do what he expects his students to do.

The Personality of the Teacher Personality is the product of learning and the result of adjustment. It is not what a person seems to be. It is what a person really is. It is more than character. It is one's character forcefully expressed. Personality is not something great and unattainable, but the product and the sum of life's simplest things. It is what one is on the inside showing on the outside. The teacher's personality is an important element in teaching technique, especially in type writing. It may increase, diminish or even negate the influences of all other factors of planning, organization, appeal to interest, psychological analysis and earnest endeavor. This importance is accounted for by the fact that the teacher is an actor as well as a stage manager—a social factor in the whole situation to which the student responds.

A strong inspiring personality is not a special gift that one receives or does not receive automatically. Personality grows. It takes its form in the thick of each day's work and play. It is shaped in the crush and stress of life's problems and its duties. It gets its quality from the character of the thoughts and acts that make up the common round of experience. A teacher may have a splendid native inheritance, a fine education and may move in the best social circles and yet not come up to his best in personality. Some high and exalted task is required to assemble one's powers and organize them to full efficiency.

It follows then that the building of personality is largely in one's own hands. True, the influence of heredity is not to be overlooked. It is easier for some to develop attractive, compelling qualities than for others. Heredity decrees that the raw material of our nature comes with us, but the finished product bears the stamp of our training and development. Fate or destiny never takes the reins from our hands. We are free to shape ourselves largely as we will. What today we build into thought and action tomorrow becomes character and personality.

The basic factors of teacher personality may be summed up in the following qualities that characterize the master teacher:

- 1 *Personal Appearance* The importance of the first impression made either on employing officials or on the students cannot be overestimated by the teacher. Personal appearance includes not just beauty of face or figure, but grooming, taste and appropriateness of dress.
- 2 *Health and Vitality* Good health is necessary if the teacher is to

have the energy, the dynamic force, required of the person who teaches with enthusiasm and power. Lowered vitality shows itself in impatience, nagging, and irritability. Youth responds to youthful traits.

3 *Poise and Self Control* The person with poise appears to be at ease in any situation, self control is the ability to reserve judgment, to control the emotions, and to remain calm in spite of provocation.

4. *Social Qualities* The ability to meet people well, to be at ease and to put others at ease, to rise to the occasion, to be a good follower, to choose associates judiciously, to be discreet in social contacts—these are the social qualities the teacher should have.

5 *Teaching Voice* Voice and character, voice and culture, voice and intelligence may be new combinations of thought, but they are very closely related. The quality of one's voice, the clearness of enunciation, surely speak louder than what one says. The relationship of speech and personality is very close. Loud, blatant, high pitched, poorly placed voices and inert, lethargic physical responses are speech characteristics that may reveal underlying personality traits.

The elements in the voice that make for an effective or ineffective use are audibility, range, quality, and control. A voice that is too soft, too high pitched, shrill, throaty, harsh, nasal, lacking in resonance and breath control becomes unpleasant and is ineffective. A voice that is clearly audible, properly adjusted to the situation where used, resonant, rich in quality, with a wide range of intensity, will not antagonize and will be effective. The monotonous voice, the chronically whining voice, or the muffled voice may indicate lack of physical vigor or wrong use of the speech organs.

6 *Speech* Speech is the key to one's personality, the English used is a personality index. Words are often the most convenient indices of education, of cultivation, and of intellectual power. Every teacher is, in a sense, a speech teacher. We must think not only of the importance of the speech habits of the teacher, but also of his attitude toward the speech personality of his students.

7 *Knowledge of Subject Matter* The teacher's awareness that he knows his subject will react favorably on his teaching personality. It will create a healthy self-confidence that will aid in the poise of the teacher. It will stimulate an enthusiasm for teaching the subject that will result in greater interest on the part of the students.

8 *Love of the Job and Desire for Self Improvement* The teacher's mental attitude toward teaching is not a negligible factor, for that will determine whether he regards his work as an opportunity, a job, or an

affliction Each of these attitudes will stamp its impress on the whole personality of a teacher Growing out of this attitude is the teacher's desire for self-improvement, for growth in service

9 *Teaching Power* The ability to inspire in others the consciousness that one can teach, that he possesses teaching skills and techniques, and that he has mastered more than he actually teaches gives teaching power

10 *A Wholesome Philosophy* The teacher's philosophy of life is an important personality trait It should be wholesome and optimistic Cheerfulness, humor, freedom from self pity, professional attitude are phases of optimism needed by the teacher who accepts teaching as a challenge One can change his philosophy of life by what he reads, his associates, or his general environment

These ten principles may be summed up as follows Personality is a combination of qualities, each in itself teachable and learnable When these qualities are so thoroughly absorbed by the individual as to become a fixed part of his being, they are expressed by him freely and beautifully and without offense to the ears, eyes, and good taste of the worth while persons with whom he comes in daily contact

Characteristics of the Typewriting Teacher. The teacher must be forceful, not weak and retiring, energetic, not lazy or afraid of work, neat in person and work, not careless or irresponsible, practical, scientific, and creative in mind A patient, friendly, enthusiastic sympathetic, ambitious individual with a well modulated voice and an inspiring optimism will make a successful teacher of typewriting if he knows how to apply psychology and pedagogy to a sufficient background of competency in the subject matter and the skills that comprise typewriting

There must be constant analysis of subject matter, constant checking of results obtained against results expected, constant study of classroom conditions and students A teacher cannot repeat the same procedure year after year and continue to secure best results The best methods of presentation may fail unless they are backed up by a personality that can encourage everyone to put forth his best efforts to accomplish his task

Evaluating One's Teaching Every teacher needs some means of measuring his teaching He must be able to judge his efforts if he is to improve them The teacher who has the desire to grow has growth practically assured

The standard of success in teaching is usually considered to be the

ability to hold a position, but opinions differ as to what constitutes failure. Many studies have been made to determine the factors that cause the failure of teachers. Dr. Robert H. Morrison has formulated, as the result of his study, a composite picture of the teacher who fails, as follows: "He is a poor disciplinarian with no ability to co-operate. He freely contributes to school gossip, is often unwise in the choice of his associates, and in a few instances he is even immoral. He lacks teaching skill and cannot adapt himself to the situation. He has no desire to grow professionally, spends as little time at school as possible, leaves his classroom immediately at the dismissal of the pupils, and frequently reports for duty after the tardy bell has rung."¹

CLASS DISCUSSION QUESTIONS

- 1 What is personality? How does it differ from character?
- 2 What is individuality? How is it different from personality and character?
- 3 How important is personality to the teacher? Is its cultivation more important than striving for high scholarship?
- 4 What methods can be used to develop and improve one's personality?
- 5 Which is regarded as more important in the personality equation—dress, personal beauty, or a pleasing manner?
- 6 In general, teachers may be placed in one of three classes in regard to the personality they possess: a strong, undesirable personality, a pleasing personality, or a weak personality. Briefly characterize each.
- 7 Which teacher renders the greater service—the one who knows his subject matter but does not understand students, or the one whose technique might be improved by further study and preparation but whose understanding of youth and personality are especially adapted to teaching?
- 8 If you were to select a typewriting teacher for a high school, what qualifications would you look for in the person to be chosen?
- 9 Why is it necessary for the business teacher to speak and write good English?
- 10 What qualities cause teachers to fail? What qualities help teachers to succeed?
- 11 Can a teacher judge the qualities of character that the students of his class need to cultivate most?
12. What characteristics should a teacher try to cultivate in his students to prepare them for success in business? How necessary is it that the teacher possess the same characteristics?
- 13 What quality in a new teacher appeals first to the students, and what molds their opinion of the teacher later?

¹ Dr. Robert H. Morrison, "Factors Causing Failure in Teaching," *Journal of Educational Research*, September 1927.

- 14 Recall several teachers whom you remember best from your own school experience and try to determine the qualities in their characters or teaching personalities that made a lasting impression on you
15. What does a superintendent look for first in selecting a teacher—personal appearance, grooming, manner, general impression, ability to carry on a conversation, social possibilities, or scholastic achievements?

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CHAPTER II

The Typewriting Student

His Reasons for Learning to Type In modern America, the desire for typing is almost universal everyone wants to be able to type Type writing is the key to office occupations, and it is the key also to innumerable career fields into which one can enter via the office door and desk Typewriting's vocational importance grows from the universal need for a means of writing both legibly and rapidly, and the same need, now more and more recognized as important in personal, nonvocational expression, has led to the use of the typewriter as an everyday writing tool in thousands and thousands of homes

The personal appeal is understandable The student who can type can save time and often get better marks when his work is typed in a neat, legible form Typing has helped many a student to earn part of or all his expenses in college Typing has simplified authorship and personal correspondence, and perhaps has stimulated both Even the student whose goal is strictly vocational makes nonvocational, personal use of his skill Thus, the ability to typewrite is a keen, personal accomplishment valued highly by the millions who possess it, a tool for better everyday living as well as for everyday working

Students of all ages are learning to type Instruction in the skill in the public schools has centered in the senior high school, but it is taught as early as the kindergarten and as late as the college The goal of instruction varies with the level on which it is offered In the kindergarten and elementary school, children learn to type primarily to stimulate their interest in creative expression In the junior high school, the goal is a mild level of personal use skill—a substitution of machine for pen in personal writing In the senior high school and business college the objective is primarily a vocational one, with strong interest in

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personal use values both for vocational students and for nonvocational learners. In colleges, goals are quite varied—some personal use courses are given, some vocational courses are given, and in teacher training institutions a third objective—showing how to teach the subject—appears as a supplementary goal.

With a tremendous demand for typewriting instruction and with a tremendous investment of time and equipment at stake, it is important that we know which students can and which cannot profit from instruction.

Predicting Ability to Learn Typewriting The ability to predict a student's probable success or failure in typewriting would be of great educational value. If some reliable measure of prognostication in typing could be found, it would prove most beneficial to students, teachers, and school administrators. A few weak students often handicap an entire class by claiming more teacher time than should be given and by retarding the progress of the better students.

Many attempts have been made to find some means of predicting typing achievement, but no single measure or combination of measures has proved reliable. Several types of studies have been made. In each, different factors were considered, the usual ones being general intelligence or I Q, motor ability such as tapping speed, eye-hand co-ordination, reaction time, and finger strength, related skills as eye or memory span, spelling or reading ability, concentration grades in other school subjects, sense of rhythm, ability to follow instructions, and personal factors, like chronological age, vocational interests, placement in school, reason for learning, attitude, and physical fitness.

Some of the conclusions arrived at by the studies are helpful and others are surprising. For example, quick motor action is not essential for learning to type successfully, and a low correlation seems to exist between spelling ability and typing skill. According to D. D. Lessenberry, the influence of intelligence on learning to type appears to be this:

Apparently the use of the I Q as a reliable measure for predicting ability to learn typing is open to question. In general those phases of typing that call for the organization of materials or work plans rather than the simple straight copy skill may offer a more reliable measure of typing achievement with which to correlate I Q. Intelligence may not be a necessary factor in learning to type but it is a necessary factor in using the developed typing skill.¹

¹D. D. Lessenberry "Predicting Ability to Learn Typewriting" *Balance Sheet* May, 1937 also Monograph 30 South Western Publishing Company

Motor reaction tests seem to offer a basis for predicting ability to type. Doctor Books' study of the correlation between typing achievement and tapping speed is well known.² Bruce White makes this statement:

Most tests of simple tapping speed have shown a fairly high correlation with typewriting ability among the extremely expert typists but indicate practically no relationship between tapping and typing speeds at lower levels of typewriting proficiency. One quite plausible explanation is that at the lower typewriting speeds each stroke is composed of a number of movement elements, and that typewriting speed is not achieved by the speeding up of each movement element but by the elimination of some of the separate movements making up the stroke.³

The whole matter of predicting ability to learn typewriting can be stated as follows: A summary of attempts to find a reliable means of predicting ability to learn typewriting must admit that no single measure or combination of measures has been proved reliable. Research must be continued.

Individual Differences of Students It is universally recognized that pupils are not alike, but differ in many ways, all of which are vital to the teacher of typewriting. The responses of pupils will vary with their individual capacities, interests, and previous experiences.

Class teaching is then a compromise for the best stimulus for one pupil can only rarely be the best for the others. A teacher has to choose what is best for the greatest number. He cannot expect to drive thirty pupils abreast along the highroad of typing for the same responses cannot be expected from all. The teacher must measure the actual progress of the class by the results of each individual pupil. The gravest error with respect to individual differences is to neglect those differences to form one set of fixed habits for dealing with all pupils to teach *the class* instead of each individual. To realize the varieties of human nature, the degree of mental differences, and the wide range of motor responses is to be protected against many fallacies of teaching typewriting.

An error that some teachers of typewriting make is in assuming that their students have natures and abilities like their own. They think of their students as duplicates, more or less, of themselves. If the teachers are quick learners, they expect too much of their students; if the

² William F. Book, "Voluntary Motor Ability of World's Champion Typists," *Journal of Applied Psychology*, Vol. VIII, 1921.

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teachers have sensible, matter of fact minds, they have no patience with the sentimentalities and sensitiveness of their students, if the teachers are precise and systematic, they fail to understand how intolerable it is for some students to lead a regular, orderly existence. Thus, one who becomes an expert typist during his training course may prove to be a failure as a teacher of the subject.

Thorndike says that the chief defects in children who are so stupid as to be unable to get on at all in school or to look after themselves outside of school are slowness in forming habits of any sort, lack of control of attention, and, most important of all, absence of, or great weakness in, the capacity to think of elements or parts. This last is shown in their inability to dissociate or analyze or respond to anything other than a gross, total situation. Yet, knowing this, such children are automatically enrolled in typewriting. Since typewriting requires absolute control of attention and in its early learning demands elemental thinking, what place has the dull child in typewriting?

There is undoubtedly much to be gained by grouping students into classes on the basis of their ability, but such grouping should be the result of scientific measurement rather than subjective judgment. If the class group in typing has been formed as the result of intelligence tests, the teaching of form work and the giving of lesson assignments are simplified. A group of superior students would grasp these things quickly and need but little review because of their excellent retentive ability. More detailed explanations and more frequent reviews are necessary for students with low I Q's. The amount of work that these groups can complete varies proportionately, also.

Teachers must recognize these differences in students. They must not attempt to put them through the same process with the idea of turning out a product that will be an exact duplicate of every other product coming through the typewriting educational machine.

The Student's Chances of Learning to Typewrite The student's chances of learning to typewrite are dependent on several things—his mental capacity, his physical fitness, and his personal make up, each of which tends to limit his possibilities for the development of typewriting skill. Sometimes even the teacher may be a limiting factor.

The Influence of the Personal Make Up The typing teacher should be interested in the typing student as a personality. All personal upsets that produce an odd, erratic personality develop typing disability regardless of the teaching done.

Whatever the student experiences as a result of his surroundings affects his attitudes and his attitudes affect his ability as a typist. If

THE TYPEWRITING STUDENT

success appears, he may be enthusiastic, which in turn brings a willingness to attack his work with renewed effort. If defeat comes he may be so depressed that he loses all interest in his work.

Whatever the student experiences within himself affects his attitudes also and will in turn affect his work as a typist. The tired typist made so by physical weakness, may be mistaken for the lazy student. Either type will lack the energy necessary for skill development. The backward or timid student will show embarrassment in his attempts to operate the typewriter. This will be a handicap in developing skill of operation. The slow, deliberate student may become a slow but accurate typist. The highly emotional student will find typing difficult until he develops control. He will lack ability to concentrate his erratic ways will produce many errors. His energy will be scattered and his efficiency will be wasted. The dishonest student will discover ways to cheat in his work unless the teacher is alert. The untidy student will smear and smudge his best efforts. The tardy pupil will not be ready to begin a piece of work or a test at the proper time.

It is not necessary to go farther with these examples. Personal feelings and personality traits closely mirror a student's life at school at home, or during his leisure time. These must be controlled before the would-be typist can expect the progress his ability will permit.

A co-operating unified class in typewriting is like a balanced personality. Hence one of the first duties of the teacher is to develop a spirit of co-operation that will make for unity. Yet the students of a class can never become so united that they lose their individual attitudes entirely, but the class unity will help to soften or decrease them.

The personality traits of the beginning typing student affect his typing skill. Therefore the successful teacher will begin to study the personal traits of each student from the first day. Any improvement that can be made in these traits will contribute as much to the future success of the student as learning the skill of operating the typewriter. A teacher may develop a fine typist but if he is dishonest or untruthful or untidy he will fail in his first position.

The Physical Fitness of the Student Too often the greater emphasis is placed on the mental qualifications when certain physical conditions are necessary for learning to typewrite. It is true the dull student can learn typing no better than he can learn other subjects unless he has superior physical qualifications. It is equally true that the brilliant student cannot acquire the skill of typing with the same superiority he attains in other subjects if he is weak in physical traits.

What, then, are some of the physical qualifications? A highly nervous, temperamental person may find the exacting work of typing difficult and may, in spite of good teaching, develop into a fast, erratic, very inaccurate typist. Sometimes the nerve strain for such students outweighs the real value of the skill of typing. The slow, methodical person cannot hope for high speed but will become a most accurate typist. The tense person will become fatigued easily and will probably not get high speed or a high degree of accuracy.

To do his best work, the typist who wears glasses or has weak eyes should have properly fitted glasses. He will then avoid eyestrain and will not have to bend over his machine. Poor posture will produce backache, especially if there is a spinal weakness. Poor posture will also bring on needless eyestrain.

Of course, the hands of the typist are very important. Persons having long, strong, supple fingers capable of control often make the best typists. Short, thick, stiff, or clumsy fingers make typing skill more difficult to attain. The fingernails should be kept short and rounded. Long, pointed nails "hook" keys and produce errors or locked type bars. A weak hand may not develop the proper touch. Not only must the hand have the strength to do the work, but it must also be capable of following the directions of the mind. There are many activities that may aid this co-ordination, such as piano playing, violin playing, drawing, handwriting, clay modeling, knitting—in fact, anything that requires finger and hand control.

Teachers are more and more being confronted with the problem of teaching typing to the student who has the use of only one hand or has less than five fingers on each hand. Although these students are handicapped, they can attain enough skill to compensate for the learning time and effort.

A specific plan is essential to teach these handicapped students effectively; and the degree of success they attain is dependent not alone on their own efforts, but on a well-organized plan of instruction, as well. The writing usually must be a combination sight-touch method. The teacher who is too insistent on touch operation at first may discourage those students. They can learn best in very small classes or with individual instruction. They require a great deal of help and usually must learn by a plan prepared for them individually. This will be discussed further in Chapter VIII.

The Student's Need for Guidance. Sometimes the student can learn better if he is not bothered by too much teaching, while on the contrary, some things must be taught vigorously and systematically with a

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teacher's guidance. Contrary to an early, widespread impression, typing must be taught with teacher guidance or teacher supervision. The glass partition mode of instruction can never be as effective or successful as the teacher-guidance method.

Teaching methods should be adapted to the most efficient learning steps. The student's natural interest must be directed by the teacher and vitalized for the student. Too often, the teacher unintentionally destroys or reduces this interest by imposing ultimate standards of performance too soon. In order to motivate intelligently, both student and teacher must be aware of the objective of the moment. The student should try to originate new and better typing habits or try to improve or fix them. He must be aroused to respond to a new idea, to apply it, to drill on it, and to test its value.

The first step in teaching typing is to get the student to experience a need so that he will want to know the best way to develop typing skill. The teacher can give the challenge and the text can set up the problem and suggest ways of attacking it, but the student solves the problem and develops power to attack new problems through the actual use of the typewriter. His work must be purposeful, activity must be guided, and effective challenges must serve as checks on activity, otherwise, student experimentation may easily degenerate into mere typewriter tinkering.

The purpose of classroom organization must be to improve the opportunities for learning, not to restrict individual initiative in attacking problems or to cause all students to conform to a particular pattern or regimentation. Measurable improvement in typing skill comes as a result of well directed practice. The problem is the student's, but the teacher supplies the challenge each day. Through this teacher challenge, the student should be led to establish orderly practice procedures and should form the habit of interpreting instructions carefully.

The teacher cannot bestow the gift of skill on the typing student. It is the teacher's responsibility, however, to assist the student in developing skill. Many people have learned to type quite skillfully without the aid of a teacher, but more rapid progress can be made with the guidance of a good teacher.

The student should seek signs of progress in his work, and when these can be recognized, a sense of satisfaction results. If he can discover these for himself, that is commendable, but usually the teacher must help to create as well as to identify periods of progress. It is equally true that the student should recognize periods of no progress and periods of recession in his learning. These periods bring dissatisfaction.

faction, and rightly so, but they should never be permitted to produce discouragement. Properly handled, they may be very stimulating.

CLASS DISCUSSION QUESTIONS

- 1 Which will do more to prevent learning progress—a lack of enthusiasm in the teacher, or a lack of enthusiasm in the student?
- 2 How does a student's attitude toward a skill subject affect his progress?
- 3 What can the teacher do to create the right attitude in the student?
- 4 To what extent should a teacher's influence carry over into the life of his students after they leave school?
- 5 Who is responsible for the failure of a student—the teacher or the student, or should it be shared by both?
- 6 What characteristics should a teacher try to cultivate in his students to prepare them for success in the business office?
- 7 What reasons have students for learning to typewrite?
- 8 What may affect the student's chances of learning to type?
- 9 What personal factors influence typewriting ability?
- 10 Can the ability to learn to type be predicted? If not, what prevents it?
- 11 How important to learning typewriting is the physical make up of the student?
- 12 How important is I Q to learning typewriting?
- 13 What is the effect of typewriting proficiency on scholarship in other subjects?
- 14 What influence has age on learning to typewrite? At what age does learning take place best in acquiring typewriting skill?
- 15 List as many ways as possible that individual differences occur in learning to typewrite.
- 16 Why is it important for a teacher to understand the amount of improvement each student should make and the amount of skill that should be attained with a certain amount of practice?
- 17 Should the teacher consider the typist's future work and needs when setting standards for his students, or should all students be held to the same standards?
- 18 Why is it necessary for a student to develop more economical methods of work and better control as the learning proceeds? How can the teacher help in this?

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CHAPTER III

The Equipment in Typewriting

The History of the Typewriter. *Early Attempts.* To trace the evolution of the modern typewriter adequately would require several books. So many inventors and businessmen have contributed their skill and energies to producing and marketing it that their numbers cannot be estimated. Out of this effort have come the outstanding typewriters of today, survivors because of mechanical excellence and usefulness.

The first writing machine of which there is record was patented in Europe by Henry Mill, an English engineer. The patent was granted by Queen Anne of England, January 7, 1714.

The first writing machine in America was invented by William Austin Burt, of Detroit, Michigan, and patented in 1829. It was called the *Typographer*, but it was not a success. The model and all original records of it were destroyed by fire when the Congressional Library burned in 1836. A model was later built by Burt's grandson, an engineering student at the University of Minnesota. This model is preserved in the Smithsonian Institution at Washington, D. C.

The *Typographer* was followed by many other attempts, both in this country and in Europe. Some of the principal ones in this country were the *Mechanical Chirographer* of Charles Thurber, of Worcester, Massachusetts, in 1843, and the writing machine of Oliver T. Eddy, of Baltimore, Maryland, in 1850. Eddy's machine was highly ingenious and did good work, but it was too cumbersome and intricate for practical use. He devoted years to its invention but lacked funds to develop it. He died in poverty after a futile appeal to the Government for assistance. A. Ely Beach, of New York, for many years an editor of the

Scientific American, patented a machine in 1856 that marked a decided advance over anything that had yet appeared. It was designed chiefly for the use of the blind, and it printed raised letters that could be read by touch. In 1857, Dr. Samuel W. Francis, a wealthy physician of New York, patented a machine, the keys of which resembled those of a piano. Doctor Francis claimed this machine could print with a speed exceeding that of the pen. It was too bulky and costly for a commercial venture. In 1868, John Pratt, of Centre, Alabama, produced a machine called the *Pterotype* (meaning winged type), but it too was not a success. Every year the need for a writing tool, between the printing press and handwriting, had been growing, and each year more men with inventive genius were giving thought to such an invention. That the writing machine would ever attain the perfection and usefulness that it occupies today was beyond the imagination of its inventors.

Its Invention On June 23, 1868, Christopher Latham Sholes, of Milwaukee, Wisconsin, patented the first real writing machine, which he called *The Type Writer*. This event marked the beginning of type writer history.

During the winter of 1866-1867, in a little machine shop in the outskirts of Milwaukee, three men, all middle aged, were each at work on a pet invention of his own, without any thought of the great achievement destined to come out of their chance association. These men were Carlos Glidden, a lawyer, but an inventor by trade, and Samuel W. Soule and Christopher Latham Sholes, printers by trade. Of these three, Sholes was the central figure. The idea for the invention of the type writer came to Glidden through an editorial in the *Scientific American*, which pointed out the great benefit such a machine would bring to the world and the fortune awaiting the inventor. They had no knowledge of previous attempts and were wholly dependent on their own creative efforts. All were amply endowed with inventive talent, but they knew little of mechanics. They were, therefore, required to solicit the aid of the skilled mechanics at Kleinstuber's machine shop in Milwaukee. The principal mechanic there was Matthias Schwalbach, who had helped Sholes with other inventions. He entered into the work with enthusiasm, developing some ideas of his own that were of great help to the inventors.

The first machine was crude and had many defects, but it wrote more accurately and rapidly than did earlier models. Letters were written and sent to friends for suggestions and criticisms for the machine's improvement. Among those receiving one of these letters

was James Densmore, of Meadville, Pennsylvania, who was immediately interested. Densmore was a practical man, with imagination, foresight, energy, and unlimited courage. Instantly, he saw the possibilities of the new invention, bought a one-fourth interest in it for \$600 even before he had seen it, and went to Milwaukee to help in its development. Soulé dropped his interest, and Densmore became the major partner. It was not until February, 1873, that the machine was deemed sufficiently perfected for quantity manufacture. During the period between 1868 and 1873, between twenty-five and thirty experimental models were built, all of which wrote capital letters only. These were given or sold to interested friends who could use them and could suggest improvements. Mark Twain owned one of these experimental models and used it to type one of his famous books.

Its Inventor Christopher Latham Sholes was born in Mooresburg, Pennsylvania, on February 14, 1819. He was of New England stock, his grandfather on his mother's side being a direct descendant of John and Priscilla Alden. At fourteen, Sholes was apprenticed to the editor of a Danville, Pennsylvania, newspaper. Four years later he joined his brother Charles, a politician living in Green Bay, Wisconsin. A frail constitution and a tendency to tuberculosis, of which he eventually died, influenced his going to Green Bay at the edge of the pine forest. When nineteen years old, he took charge of the printing of the House Journal of the Wisconsin Territorial Legislature. A year later, he went to Madison for a year to become editor of his brother Charles's newspaper, the *Wisconsin Inquirer*. Then he went to Kenosha, Wisconsin, to edit the *Southport Telegraph*, and four years later (1844), he was appointed postmaster of Kenosha. From 1848 to 1857, he served two terms as state senator and one term in the state assembly. In 1860, Sholes moved to Milwaukee, where he first became postmaster, then was Commissioner of Public Works and Collector of Customs, and later editor of the *Milwaukee Daily Sentinel* and the *Milwaukee News*. It was while serving as Collector of Customs that he began work on the invention of the typewriter. Sholes died in Milwaukee, on February 17, 1890. He is buried in Forest Home Cemetery, in Milwaukee. A fitting monument was erected in 1923 through the efforts of the National Shorthand Reporters Association and Sholes's good friend, Charles Weller, one of his first typewriter demonstrators. Sholes had five children—three sons—Louis, Zalmon, and Fred—and two daughters—Kate (Mrs. Thomas Tyrrell) and Lillian (Mrs. Charles Fortier). Ten years after the death of Sholes, his son Fred marketed some of his father's



CHRISTOPHER LATHAM SHOLES

The above typewritten design was made by Marie Fehley, a former student in the State Teachers College, Whitewater, Wisconsin

machines. Sholes's daughter Lillian was often pictured as the first woman typist.

It is of deep significance that Sholes was a printer and publisher by trade, the mechanical art most closely allied to typewriting. The typewriter was not the first evidence of Sholes's inventive genius. Years before, he had been the first to conceive the method of addressing newspapers by printing the names of the subscribers on the margin. Later, he invented the device for numbering pages serially—a device that is still used.

Sholes was a man of very unusual and attractive character, almost eccentric. He was unselfish, kindhearted, and companionable, of extreme personal modesty, of almost excessive tenderness of conscience, always more than just to others and less than just to himself. Some

phases of his character were a puzzle. He made it a rule to print in his newspaper all the adverse criticisms that were passed on him by his political opponents, no matter how bitter or unjust, and would always omit praise of himself or his work. He was singularly indifferent to wealth. He said at the close of his life that he had tried all his life to escape being a millionaire. He was always a visionary, or a dreamer. One of his dreams was of a human Utopia that would abolish all greed and poverty.

Its Manufacture and Sale In February, 1873, James Densmore took the model that was the culmination of their six years of work and with George Washington Newton Yost, a former associate of his and a fluent talker, visited the factory of Eliphalet Remington & Sons, at Ilion, New York. Without even the presence of Sholes, a contract was obtained on March 1, 1873, to manufacture the typewriter. During the Civil War, E. Remington & Sons had made guns but had taken up the manufacture of agricultural implements and sewing machines after the war. Thus, the early typewriters were mounted on a stand like the one used on the first sewing machines.

The ample resources and the skilled workmen of the Remington factory were employed to improve the machine further. Of the notable group of these mechanical masterminds, William K. Jenne stands out prominently. It was under his supervision that the model of 1873 was transformed into the first commercial typewriter and by his continued supervision that it underwent one improvement after another. So the actual manufacture of the "Type Writer" began in September, 1873.

The typewriter had many selling agents from the beginning of its sale in March, 1874, by Densmore and Yost. All were unsuccessful until 1882, when a new firm, Wyckoff, Seamans & Benedict, took the selling agency for the world. Then its commercial success began. During this time, the Remingtons acquired complete ownership, buying from Densmore in 1876 the right to manufacture on a royalty basis. Densmore had bought the patent rights from Sholes for \$12,000—a goodly sum then, but a mere pittance for the priceless invention it proved to be. It was never disclosed what the Remingtons paid Densmore, but, in the course of years, Densmore obtained royalties that amounted to more than a million dollars. Densmore has been criticized for the bargain he made, but Sholes was satisfied with his remuneration, a part of which was the joy of service. He was happy with the thought that he had done something to help the world. Without Densmore, he perhaps would not have completed the invention. Dens-

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more's unquenchable faith in the enterprise was its salvation, for Sholes became discouraged many times and would have abandoned his work but for Densmore. Their relationship was a strange meeting of opposites, for two men more unlike could hardly be imagined. Densmore was bold, arrogant, and aggressive, always impervious to ridicule and insensible to slights. Indomitable and resolute, he could not be discouraged or repulsed. Sholes was just the opposite—retiring, easygoing, a brilliant dreamer.

The decade that followed the introduction of the typewriter was a fight for public acceptance of it. At first business firms could not understand why they should pay \$125 for a machine to do the work of a pen that would cost one cent. But when business began to appreciate the possibilities of the typewriter, the demand for typists far exceeded the supply. Business colleges to train typists grew rapidly. Women up to this time were rarely seen in the commercial districts of cities, and none worked in business offices. When typewriting courses first were introduced, public opinion expressed fears that the female mind would break down under the strain of such a course. The Y W C A of New York City conducted an experiment with eight young women and the experiment proved successful. To meet the demands for typists, women began to learn to use the typewriter and obtained their first business positions. Since the typewriter has created the place that women occupy in business today, Sholes is sometimes called "The Emancipator of Women." Later, the typewriter paved the way for vocational training in the public schools.

Its Mechanical Development The development of the mechanism of the typewriter has been very rapid. During the first twenty years of its use, the Government issued 1,856 patents on typewriters. These first machines wrote capital letters only and had none of the modern devices, such as the tabulator and back spacer, and the writing was not visible. But even these crude machines demonstrated the decided advantages of typewriting over tedious and laborious handwriting.

The Remingtons made many improvements in the "Type Writer", and in September, 1876, Model 1 Remington appeared on the market. In 1878 came the first shift key machine—Model 2 Remington. The Remingtons were the pioneers in typewriter construction, claiming as other improvements the first automatic ribbon reversing typewriter in 1896, the first decimal tabulating machine, and the first key set tabulating typewriter.

Soon other makes of typewriters appeared. In 1880, the Hammond

appeared, which was the first practical type-wheel machine (the type was on a semicircular revolving wheel) The Caligraph, the first double-keyboard machine, appeared in 1884 In 1889, the Chicago was presented, featuring removable type so that another type face or another language could be typed In 1889, came the double keyboard Smith-Premier, in 1892, the Blickensderfer, also with removable type, in 1891, the Oliver, a pioneer down stroke machine, in 1896, the Noiseless, a sliding-type-bar machine that gives a quiet, pressure stroke instead of the noisy contact, in 1896, the Underwood, the first front-stroke machine, in 1904, the L C Smith, in 1906, the Royal, in 1914, the Woodstock, and in 1950, the R C Allen All these have had later, improved models, while some are no longer made Between 1890 and 1905, over one hundred different kinds of machines were marketed, but few had any distinguishing merit.

With the present day developments in the typewriter field, the beginning office worker may encounter more kinds of typewriters than his school has been able to prepare him to use There are several makes of electric typewriters There are variable spacing machines, which use varying amounts of space according to the width of the letter instead of the same amount of space for each letter This variable typing permits more typing to the page and gives the page a printed appearance The Vari-Typer, which provides more variety in line spacing than the ordinary typewriter, also has an adjustment that permits the use of over one hundred different type styles requiring 10, 12, 14, or 16 characters to the horizontal inch There are typewriters with right hand margin justifiers, machines with continuous form devices, wide-carriage typewriters, typewriters with variations in size of type and in the number of spaces to the inch, typewriters with special symbols or characters, like mathematical, chemical, and French, or typewriters with needle point type for check writing And there are typewriters with differently arranged keyboards Thus, it appears that when the student has been trained to use the standard makes of typewriters, he has only "scratched the surface" of his machine training possibilities

The Keyboard Many of the typewriter inventors were printers, and it has been said that on the early models the letters of the keyboard were arranged in the same order as in a printer's case But best authorities say Sholes arranged the letters at first in no definite order, then he juggled them about to prevent the clumsy type bars from colliding and sticking at the point of printing, resulting in practically the same keyboard arrangement as we have today This appears to be logical, since

it is known that the free operation of the type bars was one of Sholes's greatest mechanical difficulties. Following is a diagram of the keyboard on the original Remington typewriter.



DIAGRAM OF KEYBOARD APPEARING IN FIRST TYPEWRITER CATALOGUE

Only a brief analysis is necessary to show how unscientific the present keyboard arrangement really is. Several efforts have been made to change this, but all have failed. The general opinion seems to be that the loss to business would be greater than the advantage gained. Two efforts at new keyboard arrangement are worthy of mention. In 1922, Johns Hopkins University published the doctoral study of Roy E. Hoke, *The Improvement of Speed and Accuracy in Typewriting*, which was aimed at developing a better typewriter keyboard. The study is still remembered as one of the most authentic on letter frequencies, but the keyboard he proposed never reached the manufacturing stage. Since the frequencies of the 26 letters of the alphabet must be taken into consideration and form the basis for any scientific study of type writing, Doctor Hoke's study has been very useful. His letter frequency graph is reproduced on page 254. He found that *e* is used more frequently than twelve other letters combined (*y, b, p, w, f, g, v, k, j, x, q, z*) and that the first six letters (*e, t, a, o, s, i*) are used more frequently than the other twenty.

The other called the "simplified keyboard," was devised by Dr. August Dvorak and William L. Dealey of the University of Washington at Seattle. These men in their research studies decided that a rearrangement of letters on the typewriter keyboard to conform with

language usage would simplify the learning of, and speed up production on, the typewriter. On the keyboard that they designed, the most used letters are grouped on the second bank, or home row. This, they claim, permits 70 per cent of all words to be typed without reaching up or down. About 22 per cent of all words may be typed on the third row of keys, and 8 per cent of all words may be typed on the first row of keys. Since every syllable must have a vowel, the simplified keyboard concentrates the vowels on the left side (with punctuation marks and least used consonants), so, no word can be typed with the right hand alone, and very few with the left. On the right side are the common consonants. The fourth, or number, row is divided, with the odd numbers at the left and the even numbers at the right. The special signs have been shifted around in accordance with their usage.

The elimination of useless movements represents one of the distinctive approaches in promoting economy of effort. This keyboard arrangement, it is claimed, has eliminated 90 per cent of the reaching done with the standard keyboard. This, they claim, will reduce the typing learning time, make the growth in speed more uniform, and provide an improved rhythm of stroke. On the present standard keyboard, 52 per cent of the writing is done on the third row, 32 per cent on the home row, and 16 per cent on the first row. In Hoke's study it was found that in 37,365 movements made in operating the standard keyboard, only 16,055, or 43 per cent, were struck by the right, or more efficient, hand and 21,310, or 57 per cent by the left, or less efficient, hand. This has been remedied by the simplified keyboard, so that 55 per cent of the work is done by the right hand and 45 per cent by the left. The same can be said of the individual fingers.

Miss Nellie L. Merrick and Miss Gertrude C. Ford were a great help to Doctor Dvorak in the development of the simplified keyboard, and they have been devoted missionaries in its cause. Miss Merrick is the author of the first typewriting manual to teach the new keyboard—*My Typewriter and I*.

The Portable. Small typewriters had been made at different times for about twenty years, but the first portable typewriter was invented by Frank Rose in 1904. It was first called the "Standard Folding Typewriter," and in 1912 it was renamed Corona. From 1885 to 1889, several small typewriters were made in an effort to produce a lower priced machine, but these were never considered portables. The Standard Folding Typewriter weighed only 6½ pounds and truly did what its name implied—folded up. The Corona later weighed 9 pounds. Both

machines had universal, or three bank, keyboards with the double shift. In 1924, the Corona was changed to a standard four bank key board. Besides the Corona, there have been Remington, Underwood, Royal, and Noiseless portables weighing between 11 and 15 pounds. Originally designed for travelers the portable is now found in thousands of homes and is growing in popularity for use in schoolwork.

On December 16, 1875, a statement was published that the typewriter was "incomparable for teaching children to spell and punctuate." At that time, the typewriter was too large and cumbersome for a child to operate. The advent of the portable encouraged large numbers of children to use the typewriter with such astonishing results that its application to certain phases of elementary education became a promising subject of research and experimental study.

In 1929, a group of qualified educators undertook to ascertain experimentally the educational influence of the typewriter at each grade level beginning with the kindergarten and extending through the sixth grade. Previously, as the result of experiments of an informal character in a few schools, many educators became hopeful that the portable typewriter might be used effectively as a supplemental aid to the regular activities of the elementary school classroom.

To promote the study, the Typewriter Educational Research Bureau was formed, its members being the four typewriter companies making portables. This bureau provided money, as well as typewriters for the experiment. Those who initiated the experiment were assured also of the fullest co-operation from several hundred educators.

Originally, this study was to have been conducted through one school year, but the year of 1929-1930 had to be devoted to planning and setting up the experiment. After it had operated during the school year of 1930-1931 they decided to continue it for another year. The year of 1932-1933 was used to gather the results and make the reports. To carry on the study, about 15 000 elementary school children and over 400 teachers in the schools of 12 cities in the United States were contacted. The experiment was planned by Dr. Ben D. Wood, Director of Research, Columbia University, and associated with him was Dr. Frank N. Freeman, School of Education, University of Chicago. The field director was Dr. Ralph Haefner, who was in direct charge of the work.

The results of the experiment are recorded in a two volume report. The first is entitled *An Experimental Study of the Educational Influences of the Typewriter in the Elementary School Classroom* and was

written by Doctor Wood and Doctor Freeman. The second book deals primarily with the teaching aspects of elementary typewriting, and its title is *The Typewriter in the Primary and Intermediate Grades*, by Doctor Haefner. After the completion of the study, Doctor Haefner published two books for the use of children learning to typewrite: for younger children *Ted and Polly*; and for children above the fourth grade, *Fingers That Talk*, both now out of print.

In this experimental study of the educational influences of the typewriter in the elementary school, many important questions regarding the classroom use of the typewriter were left unanswered. But the data compiled threw considerable light on the nature and extent of the educational influences of the typewriter and also on its limitations as a classroom tool. Four types of evidence were collected: (1) standardized achievement-test results, (2) the writings of the experimental and control children, (3) the judgments and observations of the experimental teachers, and (4) the opinions and attitudes of the experimental children as expressed in letters that they wrote to their teachers and principals regarding the typewriters. As a result of two years of experimentation and research, it was felt that there was strong evidence (1) that it is feasible to use the typewriter in ordinary work in the elementary school; (2) that the use of the typewriter stimulates elementary school pupils to produce more written material than they would otherwise produce; (3) that the classroom typewriter, as used in this experiment, entails no loss in handwriting quality or rate; (4) that it probably raises in some measure the level of achievement in some of the fundamental school subjects, without observable loss in any subject; and, finally, (5) that the teachers regard the typewriter as a valuable educational instrument and approve its use in their own classes, while the pupils enjoy typewriting and look upon the typewriter with marked favor. The use of the typewriter in the realm of child education is still very much in its infancy, but its future is promising.

Machine Mechanics. It is just as essential that the student understand his machine mechanically as that he know how to operate it. This necessitates the teacher's being familiar with the typewriters in use. That will stimulate the confidence of the student in his teacher. Therefore, success as a teacher of typewriting requires some mechanical-mindedness.

The first class period in typewriting will include a demonstration of the machine parts that are to be used in the first writing efforts. Other

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2.

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Several makes of electrically operated typewriters are on the market, among them IBM, Underwood, Remington, and Royal. Their ecreasing popularity in business is reflected in their growing popularity in schools. The manually operated typewriters—Remington, Underwood, Smith-Corona, Royal, R. C. Allen, Remington Noiseless, and Underwood Noiseless—have enjoyed a universal use for many years and are still predominant for classroom instruction. The parts of these manual machines may be outlined as follows:

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machine parts will be taught as they are needed. This occasional study of the machine will provide a valuable diversion from the typing routine.

Personal demonstration is the best means of learning the machine parts, as well as the techniques that come later. If the class is small, it may be gathered around a machine, as the teacher sits or stands at the typewriter. If the class is large, the machine may be elevated where the class can see to the best advantage. A demonstration table, or stand, is necessary equipment—not only when the machine parts are being taught at the beginning, but also throughout the entire course. The stand should be on casters so that it may be moved about the room easily. It should be of sufficient height so that the teacher may type from a standing position. Since several teachers using the same room may vary in height, the stand should be adjustable. The typewriter should always be high enough so that the teacher can maintain the proper position of hands and forearms at the keyboard. There should be a drop leaf on the right or both sides of the stand where the textbook or copy may be placed. A good carpenter can construct such a stand, if given clear instructions. There are several excellent metal, adjustable demonstration stands on the market. While these are more expensive than a home built stand, they make a better appearance in the typing room.

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I. Key parts:

1. Finger keys
2. Shift keys
3. Shift lock (sometimes 2)
4. Space bar
5. Backspacer
6. Tabulator key or keys, or bar
7. Key release (Remington)
8. Ribbon-position key or device
9. Margin-stop release
10. Type basket
11. Type bars
12. Type:
 - a. Upper case (shift characters)
 - b. Lower case
13. Tabulator-set key
14. Tabulator-clearance key or device

II. Carriage parts:

1. Line-space or carriage-return lever
2. Carriage-release spring (right and left)
3. Carriage-tension strap or band
4. Mainspring
5. Mainspring adjustment
6. Cylinder or platen
7. Cylinder knobs (right and left)
8. Paper bail, clamps, or fingers
9. Paper rest or table
10. Paper-edge guide
11. Paper release
12. Feed rolls (vary in number and size)
13. Scales:
 - a. Front, cylinder, carriage, or margin
 - b. Paper-edge guide scale
 - c. Line scale
 - d. Tabulator scale, except on key-sets
 - e. Centering scale on Underwood
 - (1) Red scale on 80-space scales
 - (2) Green scale on 90- and 100-space scales
14. Page gauge (Smith-Corona and the two Noiseless)
15. Automatic margin-stop keys or levers
16. Margin stops
17. Margin-stop release (two on Underwood)
18. Line-space gauge
19. Palm tabulator (Royal)
20. Printing-point indicator
21. Type-bar guide
22. Variable line-space devices (lever and cylinder button)

- 23 Thumb piece on some machines
- 24 Card or envelope holders, or clamps
- 25 Touch control and (Royal) carriage tension control

III Ribbon mechanism

- 1 Ribbon (one or two-color)
- 2 Ribbon spools
- 3 Ribbon gear shaft
- 4 Ribbon gear shaft shifting device
- 5 Ribbon guide, carrier, or vibrator
- 6 Ribbon position device
- 7 Ribbon cut out or stencil device
- 8 Automatic ribbon reverse mechanism
- 9 Ribbon cups, or guards
- 10 Ribbon free running lever (Royal)

IV Tabulating devices

- 1 Jump stop or single key tabulator
 - a Machines
 - (1) Underwood (No 5)
 - (2) Royal (first models)
 - (3) Woodstock (first models)
 - (4) Remington (later No 12 first No 16)
 - (5) Remington and Underwood Noiseless (first models)
 - b Parts
 - (1) One tabulator key
 - (2) Four or more tabulator stops
 - (3) Tabulator rack with scale
- 2 Multistop tabulator
 - a Machines
 - (1) Remington (No 10 and early No 12)
 - (2) L C Smith
 - (3) Underwood (first No 6)
 - b Parts
 - (1) Five or more tabulator keys (including decimal types)
 - (2) Five or more tabulator stops
 - (3) Tabulator rack (reversible on some models)
 - (4) Tabulator scale
 - (5) Five stop pawls
 - (6) Stop guide (on models without scaled rack)
- 3 Key set tabulator
 - a Machines
 - (1) Underwood (No 6)
 - (2) Remington (No 17)
 - (3) Royal
 - (4) L C Smith and Smith Corona
 - (5) R C Allen
 - (6) Remington Noiseless
 - (7) Underwood Noiseless

b. Parts:

- (1) Tabulator bar or key
- (2) Tabulator stop set-key
- (3) Stop clearance device or key
- (4) Tabulator rack
- (5) Tabulator stop for each letter space

Many of the machine parts just listed are found on the electric typewriter, with a few new ones added. The teacher using the electric can easily adapt the outline for that use.

Students may be tested on their knowledge of machine parts before they complete their typing course by the use of objective tests—true-false, completion, or multiple-choice—a variety of which may be formulated easily. Students should be taught to make intelligent use of the many devices their typewriter possesses, such as the tabulator, the variables, the margin releases, etc. They should learn how to rule their work with pencil, both vertically and horizontally, while the paper is still in the machine.

Care of the Typewriter. Caring for a typewriter seems such a simple task, yet it is amazing how many schools give no attention to the matter. A typewriter repairman would maintain that the majority of repair work is due to the lack of proper cleaning of the machine. Parts become clogged with ribbon lint and erasure bits. When these come in contact with the machine oil, a hard mass is formed, which sticks to the parts and causes much trouble.

How often a machine should be cleaned depends on the extent of its use. For average school use, about once every one or two weeks is sufficient; while in an office, a good stenographer will dust and clean her typewriter each day. It is no longer necessary to oil a typewriter. The type should be cleaned often, because the ink dries in the letters and makes a blurred impression. There are many cleaning devices available, but a good brushing is often sufficient.

Cleaning the machine thoroughly can be made an individual responsibility or a class exercise. A great deal of unnecessary machine repair will then be avoided.

Servicing the Machines. Typewriters that need repairing should be identified in a systematic and efficient manner. This will save valuable teacher time, costly repairman time, and will reduce class interruptions. Various plans may be used. Most of these plans require that all the typewriters in the class be numbered, and some teachers also number the typing tables to correspond. The numbers may be painted or

pasted on the back of the typewriter frame. Before numbering the machines and tables, typewriters of the same make should be grouped together and arranged in a permanent order. Students should not be permitted to move typewriters from their assigned tables, but if this does happen, the numbering system will provide an easy readjustment of the machines.

One workable plan is to have a diagram of the room on which a small card is hung when a machine needs repair. Should the teacher not be in the room when the serviceman arrives, he can tell quickly by reading the card just which machine needs repair and what the difficulty is. Another plan is to keep a card index. The card is made out when the typewriter is bought, and on this card is kept an exact account of the expenditures for repairs, the type of repairs, and the parts replaced. This takes time, but from this careful allocation of repairs and charges, it is possible to determine which machines should be replaced to effect the greatest economy in service. Students may help these plans to function successfully. When a machine fails to operate correctly, the student should place the number of the machine on the paper on which he is typing and give this to the teacher. This sample of work gives the serviceman a better idea of the failure of the machine. Should the nature of the mechanical defect be such that it cannot be shown by typed material, then the student writes the number of the machine and a brief description of the difficulty on a paper and gives it to the teacher.

Typewriter Ribbons, Platens, and Paper There are many degrees of inking and kinds and weights of cloth used in typewriter ribbons. The right combination for one typist may work poorly for another. The ordinary ribbon sold commercially is inked for use with pica type. When this ribbon is used with elite type, impressions are often too dark, and the type fills quickly. Should the lightly inked ribbon be used with pica type, impressions are often too light, and the ribbon will not last as long as one with a heavier and correct degree of inking. With medium inking and medium touch as a basis, a soft touch requires a ribbon with a little more ink for good impressions, a strong touch, a ribbon with a little less ink. Touch, therefore, is intimately linked with size of type in determining the best inking of ribbons for each typist.

Heavy cloth ribbons resist longer the cutting action of sharp type. That is their only advantage. The thicker yarns will not permit fine impressions, either on the original or on carbon copies. Silk ribbons,

because of their unusually fine weave, permit perfect reproductions of type faces

Record ribbons are most commonly used for original typing, because their impressions are relatively permanent. Additional copies are made by using carbon paper. *Hectograph* ribbons are used to type *master* copies for gelatin process duplicating machines.

Typewriter ribbons for standard typewriters are from 10 to 12 yards in length. The cheaper ribbons are usually shorter. After some ribbons have been wound back and forth a few times, they sometimes spread out in the spool, and a length of ribbon may have to be torn off to keep it from running off the spool or stopping the machine. Students should be taught how to keep ribbons operating well and should be drilled in putting on new ribbons.

Badly worn platens produce uneven typing and should be replaced. Soft platens, because of their "cushion" effect, give beautiful, clean cut impressions, but very few carbon copies. A medium platen is generally recommended for neat, uniform typing and multiple copies. A hard rubber platen or special composition or brass platens are used when more than ten or twelve carbon copies must be made.

Papers that are fuzzy or too crinkly, glazy or spongy produce uneven or too light impressions that no ribbon can overcome. Paper having a smooth and substantial body usually guarantees good work.

The Typewriting Classroom Location. Care should be taken in locating the typewriting classroom when planning a new building. A desirable location would be a north exposure—provided the room has plenty of windows. Second choice to this would be an east or west exposure. A south exposure is not recommended, because it gives too much glare due to the bright sunlight. Many authorities consider a corner room to be the most desirable location—northeast or northwest. The typing room should be near the office practice and shorthand rooms if the typing equipment is to be used in those courses. The typing room should be located so that the noise of the typewriters will not disturb other classes.

Size. The typing room should be large enough to avoid a crowded appearance. An overcrowded room brings the students so close together that the nerve tension is increased. If the room is large, it should have two doors that lead into the corridor—one door to be used for the class just dismissed, and one door for the class entering to avoid congestion.

Soundproofing. If the building is constructed of steel and concrete, there is a certain reverberation that should be corrected. To do this, the

ceiling should be made of insulating building board, such as "Weather wood" The use of this material will tend to reduce the noise of the typewriters and also make it possible for the teacher or student to be heard more distinctly at the far end of a large room A material that is being used in the ceilings in some typing rooms is "Acoustical Tile" This comes in any size or pattern desired It is made of cane or wood pulp and sold by several companies Where expense is a major factor the use of insulating board is not recommended for the ceiling unless in new construction it is necessary to use metal lath for the plaster In that case, there is very little difference between the cost of the plaster and the cost of the insulating board

Lighting A typing room should have plenty of windows, because lighting is an important factor This natural light should come from the left and back Since the line space lever on modern typewriters is uniformly placed at the left, this makes it natural to place the copy on the right side, which is the best side for easy reading for most people The light source should then be placed at the left for best results The windows should be provided with double, ecru color shades that roll up and down from the center of the window This type of shade makes it possible to control the light and ventilation better than with a single shade Venetian blinds may be used but they seem to reduce the amount of available light

The room should have good artificial lights of the indirect lighting type These should be sufficient in number for the size of the room and should be installed 9½ feet from the floor to eliminate all shadows on the work Some prefer fluorescent lighting Ceiling panels of indirect lights may be used

Built in Equipment Every typing room should be equipped with running water because of the need to wash hands frequently after using carbon paper handling typewriter ribbons or making minor machine repairs This should be placed in the rear of the room where it will be the least conspicuous A supply cabinet of ample size should be provided for instruction materials and typewriter supplies This may be built in or movable

Good blackboards and bulletin boards are important in a typing room Some blackboard space is needed in the front of the room for the use of the teacher when giving instructions for assignment work Blackboard space in other parts of the room may be used for progress graphs and for records of tests and competitive stunts held to gain speed and accuracy in typing The blackboard and bulletin board are

two of the most effective means of showing the student not only what he has done himself, but also how his work compares with that of his fellow classmates. The bulletin board should be placed in the room where it will have good light and where students may have easy access to it. A large room could well afford to have two bulletin boards.

The bulletin board can be an important motivating factor. The work posted on it should be changed frequently to hold student interest. Above all, the bulletin board should never look cluttered. Specimens of work may be kept on the bulletin board. It is generally possible to find a creditable piece of work done by a poor or slow student, and it will greatly encourage him to post this. That may be just the time that he needs encouragement most. Finally, do not choose exhibits indiscriminately; if the best results are to be obtained, choose those exhibits that produce the desired influence, that teach the required lesson, that convey the information needed by the class.

Teacher's Desk. The typing teacher should have a modern, flat-top office desk with ample drawer space conveniently arranged for the individual needs. Manufacturers of business furniture offer quite a variety of styles and materials. The most desirable style is the double-pedestal, flat-top desk, because it provides ample drawer space. A good chair, of the same design as the desk and suitable to the teacher, should accompany the desk. An extra chair should be available, if possible, similar to the teacher's chair, to be used for visitors or for student conferences.

Typewriter Desks and Chairs. The desks and chairs used in a typing room should be solidly constructed to avoid vibration. The desks should be from 26 to 30 inches in height, depending on the stature of the students. The desks and chairs should be adjustable in height. The desks should be adjustable to at least three different heights, and the chairs should vary in height from 16 to 18 inches. The typing desks sold generally for many years are only 26 inches high. This is too low for efficient typewriter operation, except for persons of small build. Blocks placed under the desk legs or boxes placed under the typewriter can be used to adjust desk height, when adjustable desks are not available. The 26-inch desk is suitable for electric typewriters, because their keyboards stand higher from the desk than manual typewriters. Also, the typist sits lower at electric typewriters than at manuals, because he is not required to exert so much power in operating the keyboard.

The adjustable desk appeared on the market a few years ago. There are many designs, but all permit desk heights ranging from 26 to 31

inches One type uses a platform on which the typewriter rests, and the desk height is changed by inserting the platform in any one of three slots placed two inches apart One furniture company offers a variation in the universal study-hall desk They are not instantly adjustable, but by adjusting certain rows of desks and seats for different heights, students of varying stature may be accommodated The chief advantage of these is that they permit *greater flexibility in satisfactory seating* Some schools use long tables to accommodate a row of typewriters, but these tables are unsatisfactory because of variance in student stature, as well as confusion and *interference from noise and vibration*

The latest types of adjustable desks are made of metal and/or wood Like the latest adjustable chairs, these desks are far superior to earlier models

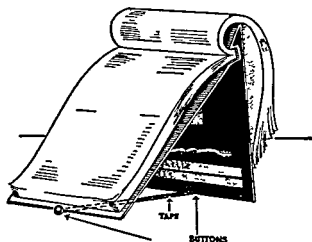
One suggestion for a saving in money without impairing the value or usefulness of the equipment is to purchase a combination bookkeeping and typing desk This is well suited to the small, one-room business department

Supplementary Equipment A filing cabinet of ample size should be provided for students' work, records, etc A table for the paper cutter, punch, stapler, and pencil sharpener should be placed in the rear of the room A sufficient number of wastebaskets should be well placed in the room Dictionaries, placed perhaps on dictionary stands or racks, are necessary equipment, and there should be one dictionary for every ten students Wire, metal, wicker, or wooden desk trays to hold the students' work, and a call bell or buzzer for the teacher's use as a signal in large classes are necessary items of equipment

Every student should have a copyholder that is suitable for holding his textbook or notebook in a position that permits his line of vision to strike the copy at *approximately right angles* as he sits in correct position at the machine The simpler types of copyholders are best suited for general classroom use where books are mainly used Very satisfactory and rather inexpensive copyholders may be made in manual training departments or local carpenter shops The simplest bookholder is the string-button type It consists of two buttons, two pieces of wood, or even two paper clips, fastened at either end of a piece of tape about 8 or 10 inches long This simple device holds the book in a copyholder fashion (See page 38 for illustration) A test copy or small drill booklet may be stood up against the book or clamped to it with a clamp clothespin The length of the string determines the book's pitch or

angle, thus making it adjustable. Some of the latest books are so bound that the cover may be rolled back to elevate the book.

A good stop watch with two hands, one registering seconds and the other minutes, both of which fly back, is good for short timings. A time-stamp clock for use in recording the exact moment of starting and completing assigned tasks is much more valuable and less expensive than the stop watch. There are several interval timers on the market. One model rings a gong at the end of the time interval, making it unnecessary for the teacher to call time to stop the typing. This is useful for practice tests—the student can time himself.



Tie a button or any small object at each end of a tape or string

Visual Aids to Instruction. Traditional methods of teaching typewriting have not taken into full account the results to be obtained by visual instruction in skill subjects. Effective instruction requires that teachers have and use materials and devices that will clarify the point involved or develop the action desired. One of the aims in effective typing instruction is to get students to understand and to practice correct methods of typewriting. Students learn more readily through concrete demonstration, through visual instruction. Too much explanation on the part of the teacher frequently results in confusion.

It is said that 65 per cent of knowledge is absorbed through sight; 25 per cent through hearing; and the other 10 per cent through touch, taste, and smell. This means teachers of skill subjects should talk less and demonstrate more. Incorrect typing habits often result from incorrect mental pictures of what is required. Essentials should be demonstrated in view of the class.

Motion pictures are an excellent form of visual instruction, especially where action is to be portrayed. Good form in typing can be determined by analysis of the performance of the expert typist through slow-

motion pictures Most students have great capacity for observing and imitating what they see The beginner who sees correct typing technique on the screen transfers what he has seen to the feeling of the proper finger movement, this stimulus, then energizes the correct finger, and prepares for the correct finger stroke After a few trials, he is able to do what he has seen demonstrated on the screen One major aim in teaching typing should be to stimulate the development of the experience of correct stroking technique, of definite kinesthetic sensations of finger movements This can be done with some success by teacher demonstration, but when such demonstration is supplemented with desired techniques clearly shown on the motion picture screen, the visual image of such action is made plain, and the experience of the feel of typing takes definite form

Many types of visual expedients are more simple than these Like most expedients, they are intended to emphasize the point the teacher is stressing in order to make it more vivid to students Sometimes an exaggerated movement of the arm in the air to imitate the desired swift, positive reach and stroke of a finger will do more than anything else to obtain that kind of stroke from students A nod of the head, an appropriate facial expression, a lilt of the voice made at the right time can set off desired responses from students The blackboard with its possibilities for diagramming may be a most effective visual aid, and the use of varicolored chalks will greatly increase its value Textbook illustrations may be well planned learning aids, especially those showing correct body posture, correct arm and hand positions, finger reaches, etc The posting of correct typewritten forms on the bulletin board will also serve as a visual aid These expedients will save the teacher's voice and time, as well as speed the instruction They will also make it easier for the students to respond properly

The two most important auditory aids are the teacher's voice and the sound of the typewriter in demonstration The voice in dictation facilitates recall, improves mental and physical coordination, encourages forceful fluent stroking eliminates fear and hesitancy, produces immediate student reaction stimulates student endeavor, and establishes confidence within the student In fact, the voice may be used profitably on all skill levels and in a variety of ways The teacher's use of the typewriter to demonstrate various typing activities is a forceful auditory aid Through this use, tremendous gains in skillful performance have been made after students acquire positive "sound" impressions of fluent stroke patterns

Visual aids may be classified broadly into several main groupings (1) wall charts and diagrams, (2) pictures and illustrations, (3) observation of demonstration typing, (4) models, (5) films, (6) displays of student prepared materials, (7) school field trips, and (8) lantern slides. Each of these has a definite place in typing instruction and, when skillfully used, makes a positive contribution to improved classroom instruction. The aids selected for use should be carefully chosen and well constructed, they should conform to sound, up to date philosophies of teaching, and they should contribute to effective learning as well as to teaching efficiency. Only those aids making *measurable* contributions to learning should be employed in the classroom. Several considerations should be made before adopting them for use: (1) Teachers should appraise them in terms of their educational values rather than their commercial values. (2) Teachers should determine the appropriateness of the aids for the group of students using them. (3) Teachers should make certain that all aids are in agreement with modern business practice. (4) Teachers should evaluate the results obtained from using visual aids in terms of the amount of time required to handle them.

The use of visual and audio visual aids in the classroom will be of assistance in the presentation of typing if they (1) give the students a more concrete picture of what they are taught, (2) motivate the lesson, (3) unify the background of the students, (4) correlate the information presented, (5) reinforce the lesson, and (6) take care of individual differences. Audio visual aids are only aids and not substitutes for good teaching, but, when integrated with teaching, they make even good instruction more vital, informative, and interesting.

Each year the supply of audio visual aids material is growing. The sources of supply, suggestions for use, and cost to the school are more readily available to teachers. There has been a great improvement, especially in films. One of the newest developments is the text film which is a filmstrip or motion picture prepared specifically for correlated use with a designated textbook. While only a few of these have been produced at present, eventually filmstrips may be available to correlate with all typing textbooks.

The topic of visual aids cannot be treated here as completely as it merits. Many fine magazine articles have been written on the subject. The first step in the use of visual aids is the training of teachers. This involves the in-service training of present teachers and the training of prospective teachers. Such training should include familiarity with the

best research in visual education and with the selection of projectors and related equipment, such as projection stands, screens, room darkening equipment, ventilators, air conditioners, etc. It should also include a knowledge of the visual aids available and some knowledge of the preparation of some of the simpler, projected visual aids. It should include a knowledge of the proper operation and care of the various types of projectors and a working knowledge of the proper organization of a student visual aid squad to carry on the routine of projection. In an adequate teacher training program in the audio visual field, the necessary competencies and the experience required to achieve them will be clearly outlined.

The procedures involved in the correct use of visual aids are more or less standardized. The *United States Navy Training Aids Manual* suggests the procedure clearly and completely. Teachers who are just starting to use films would profit by reading this manual.

The Typewriting Room A teacher's individuality and interest in his work are very often reflected in the appearance of the room in which he teaches. To be attractive, the typewriting classroom should be businesslike, neat, and orderly. Well arranged equipment, desks in even rows, chairs and typewriters in their places, and no wastepaper on the floor will produce an attractive room. A neat and orderly classroom should stimulate orderly conduct in the class.

Each student should be assigned a typewriter when the class is organized. To make proper progress, students should not shift about from one typewriter to another, even of the same make, for they do their best work after they have become accustomed to the touch and action of one machine. While the keyboard is being learned, students should work with the same typewriter until dependable typing habits are formed. After the initial learning period, seating changes may be made.

Ideally, the beginning typewriting room should be equipped with typewriters of only one make. If a school is large enough to have several beginning rooms, each room may be equipped with a different make of typewriter. An advanced typewriting room may contain all the most used makes of typewriters in equal proportion or in whatever proportion is typical of the offices of the community. This is especially true in larger city schools. In smaller schools, typewriters may be chosen in accordance with the demand of the community in which the school is located and the best available repair service. Teaching should be such that, after a student has mastered one standard typewriter, he can easily acquire skill in the operation of other typewriters.

CLASS DISCUSSION QUESTIONS

- 1 What are the differences between the Standard and the Universal Key board? Name some machines as examples of each
- 2 Point out as many unscientific features of the Standard Keyboard as you can, then work out an arrangement of keys that would be more scientific
- 3 Where is the serial number on the standard makes of typewriters? What does it indicate, of what use is it?
- 4 Of what use is the ribbon cut out or disengager? How does it differ on the various makes of typewriters?
- 5 Why is it best that typewriters be kept set for typing on the upper edge of the ribbon? How can both edges be used?
- 6 What feeds the paper into the typewriter? Will paper feed in if the paper release is locked? If not, why not?
- 7 Which typewriters have a contact stroke and which have a pressure stroke? Why is the contact stroke noisy and the pressure stroke quiet?
- 8 Most of the typewriter keys are stroke keys Which keys are push keys? Compare the operation of each
- 9 How does the stroking for electrically operated typewriters differ from that of contact and pressure machines?
- 10 Why may an electric typewriter be used with a table lower than that used with manual machines?
- 11 Must students be trained in school on either electric or noiseless typewriters to use them successfully in the business office? Discuss the transfer of training between the three types of typewriters
- 12 How many pica characters may be written to an inch and how many elite? What is the proportionate use of these kinds of type?
- 13 Are margin stops used to regulate the length of line or the width of margins? What machine has separate devices for right and left margin releases?
- 14 Most typewriters have two devices that permit typing freely at any point vertically One device is used to return automatically to the original line of writing Which one? Of what advantage is this?
- 15 Why is a paper-edge guide a necessary part of the typewriter? How is it set for different widths of paper and for different scale lengths?
- 16 What is the difference between visual aids and audio-visual aids? What are the two most important auditory aids in typing? What is the latest film that has been made for typewriting instruction?
- 17 Compare these two keyboard revisions the Dvorak or Simplified Keyboard and the Rhythmic Keyboard by Maxwell What advantages has each over the present keyboard arrangement? Any disadvantages?

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CHAPTER IV

The Development of Typewriting Instruction

The First Instruction The early typewriter distributors had to encourage the use of the typewriter. To promote its sale, they used circulars and catalogues that described in some detail the possible uses of the machine, its potential contribution to business efficiency, and its simplicity of operation. The first such published instruction is believed to be an undated circular of the Remington Sewing Machine Company, of Louisville, Kentucky. It read "Practice upon the above by touching each letter (one at a time) in any desired word, and the 'space key' after the word. One or two hours' practice daily, will soon enable you to write from 50 to 100 words per minute upon the machine." The instruction given in the offices of the distributors consisted of a free lesson and demonstration.

Businessmen soon turned to the schools for trained operators. Although there is some doubt as to what school was the first to offer typing instruction, *The Story of the Typewriter*¹ says the first school to teach typewriting is believed to have been the D. L. Scott Browne School, in New York City, in 1878. Later sources say the Packard School, in New York City, taught typing around 1863 as a part of their stenographic training course. As schools began to increase to meet the growing demand for typists, textbooks became necessary. Between 1880 and 1889, seven typewriting texts (averaging 43 pages each and all bound at the left) were published in printed or stenciled form. The first known typewriting textbook was Edward F. Underhill's *Handbook*

¹Published by the Herkimer County Historical Society, Herkimer, New York, 1923.

of *Instruction for the Type Writer*, published in 1880. It contained sixteen pages, was bound in stiff art paper, and opened from right to left. From July 1, 1889, to June 30, 1891, about 60,000 persons were taught to typewrite. During the decade of 1890 to 1899, the typewriter was improved greatly, and twenty seven textbooks were published.

The Sight Method Naturally, the first operating methods were sight methods that used one or two fingers of each hand because the third and fourth fingers were believed to be too weak. The sight method could be learned without either a text or a teacher. Charts of the key board were used sometimes for memorization. At first, there was no effort to assign certain keys to certain fingers, and no technique was taught, each operator developing his own. The method is still used and is known by a variety of names, namely, the "hunt and peck," the Columbus, or discovery method, or the Biblical ("Seek and ye shall find") method.

The first sight operator of exceptional skill was Frank E. McGurrian, who taught himself in 1876 on a Model 1 Remington while he was a clerk in a law office in Grand Rapids, Michigan. In 1878, he changed to Model 2 Remington. One day McGurrian was told by a friend that he had seen a court reporter dictating direct to a young lady typist who typed with all her fingers and without looking at the keyboard. McGurrian says in *The History of Touch Typewriting*:

Boy like, I made up my mind that whatever a girl could do I could do so I set to work to learn to operate without looking at the keyboard. Before the end of the year 1878 I could write upwards of 90 words a minute on new matter without looking at the keyboard. I did not meet the girl for two years after and then learned to my surprise that she did not operate the machine without looking at the keyboard and had never attempted to do so. Every thing is difficult when no one has ever done it but everything becomes easy when someone has shown the way.

Years later, McGurrian was given credit for originating the touch method. Frank and his brother, Charles McGurrian, also an expert typist demonstrated up and down the country and wrote and spoke on the subject of typewriting. Their work attracted widespread attention and encouraged both teachers and typists to develop greater skill. Louis Traub was an expert sight operator of this early period, using the Caligraph, a double keyboard machine. These operators analyzed as best they could how skill is acquired.

The All-Finger Method The all finger method was originated by Mrs. M. V. Longley, of Cincinnati, Ohio. She devised the method in

her business school in 1881 and publicly advocated it in a talk before the First Annual Congress of Shorthand Writers at Cincinnati in 1882. She got the idea from using all fingers in playing the piano. She published her material in book form in the same year and called it *Typewriter Lessons*. It was the second typewriting textbook published, and it started among teachers the first discussions of teaching methods in typewriting.

The first convert to the all finger method was H. V. Rowell, of the Remington Typewriter Company. He became a real missionary for the cause, although most educators thought he was a "crank." Their criticisms were that the third and fourth fingers were too weak and students wouldn't take the trouble to use them. The all finger method was a touch system in its results, but not in its main purpose, which was to secure and improve the method of fingering. It was still sight writing.

The first business educator to take up the all finger method was W. E. Hickox, of Portland, Maine. He did so at Rowell's suggestion. It was several years before any other school followed his example.

At the Fourth Annual Congress of the International Association of Shorthand Writers, held at Harrisburg, Pennsylvania, in 1884, Rowell spoke on typewriting and added to his indorsement of Mrs. Longley's views another point that made a great impression on teachers. His contributing point was this: The use of all fingers enables the operator to keep his eyes on the copy and thus attain greater speed.

Soon after this, B. J. Griffin, of Springfield, Massachusetts, and Bates Torrey, of Portland, Maine, became practical exponents of this new idea in teaching typewriting. Mr. Griffin introduced the all finger method in his school to the exclusion of all other methods, and the remarkable skill of some of his graduates soon produced a deep impression on other business educators.

Another event that proved the value of the all finger method and that helped to blend it into the touch system was the first typewriting contest held in Cincinnati July 25, 1888, between Frank McGurran and Louis Traub. The contest is described in *The Story of the Typewriter* as follows:

The modern typewriting contests are interesting mainly as demonstrations of the utmost capacity of the operator, but the contest between McGurran and Traub had a far deeper significance. It was really a contest between two different systems of typing—the new and the old. Louis Traub was an instructor in typewriting and agent and expert operator of the leading double keyboard machine of that day. Both in the keyboard used and the method used, he opposed McGurran. The conditions called for 45 minutes writing

from dictation and 45 minutes from copy, unfamiliar matter being used McGurrin won decisively on both tests, but the significant fact was that his speed increased 3 words per minute when writing from copy, while Traub's speed fell off 12 words per minute on the same test The reason is obvious, McGurrin's eyes were always on the copy, while Traub was compelled to write an "eyeful" at a time Traub was open to conviction and accepted the logic of the result without reserve He subsequently became an expert touch operator of the shift key machine

It was a contest between methods (sight versus all finger or touch) and machines (single versus double keyboard) Frank McGurrin won both decisively, proving the decided advantage of the single keyboard and the use of all fingers McGurrin's advantage was greatest on the copying test largely because of his method of operation On the dictation test, the machine was the greater difference The approximate speeds made were McGurrin, 96.5 words a minute on copying and 93.5 words a minute from dictation, and Traub, 65 words a minute on copying and 77 words a minute from dictation

In the Metropolitan Typing Contest held in New York in August, 1888, Frank McGurrin copied at 98.8 words a minute for 5 minutes and wrote 101 words a minute from dictation blindfolded He is said to have later reached a speed of 125 words a minute in contest competition

The Touch System It was only a step from the all finger method to the touch system Seven years after the all finger method was originated, it had become simply a means to an end—the ability to write by touch The final step was made by Bates Torrey in 1889, when he published *A Manual of Practical Typewriting* The word "touch" seems the natural term to apply to this method, but Bates Torrey was the first to use the word in a printed manual There was a great advance in the point of view of his book over Mrs Longley's *Remington Typewriter Lessons* During the next few years many new touch manuals appeared, and one school after another adopted the touch method, until it was firmly established in the East

The growth of the system in the Middle West was due mainly to the efforts of another typewriter man, O P Judd, manager of the Remington office in Omaha, Nebraska Two Omaha educators, A C Van Sant and F W Mosher, urged on by Judd, entered into a friendly competition, and the rival exhibitions given by their well trained pupils soon spread the method far and wide About 1900 Mr Van Sant gave an address before the National Commercial Teachers Federation on the subject of touch typewriting followed by a demonstration by two

of his students. The address was so eloquent and logical and the demonstration so impressive that touch typewriting began to sweep the country.

Early in 1901, the Remington Company surveyed the schools of America and found that half the schools of the country had already begun instruction by the touch system and a majority of the other half announced their intentions of doing so shortly. Yet most teachers did not believe touch typing was practical or even possible for the average person, although typewriter companies continued to encourage and sometimes to employ touch experts for contest and public demonstration purposes. Griffin, Torrey, Van Sant, and a few others continued to train touch typists, some of them experts, and to advertise its merits.

The typewriter company demonstrators were the first to analyze their skills in their attempts at publicizing their particular fingering and training methods. These attempts at analysis were often made up on the spur of the moment. The result was that many confused ideas with regard to rhythm, posture, speed, and accuracy were carelessly set in motion during this period and have continued to plague typing instruction ever since.

Mrs M V Longley (Cincinnati), Mrs Arthur J Barnes (St. Louis), and Mr A C Van Sant (Omaha) saw their typing texts produced and circulated by the thousands until well beyond 1900. Torrey and Van Sant spoke out strongly for the use of a demonstration typewriter on a raised table to improve teaching efficiency. Van Sant made a plea in his text for introducing new reaches and for conducting daily warm ups by means of unison drills. Griffin featured the fact that he blind folded every student at certain times and dictated direct to the typist, thus forcing touch operation. All emphasized the need for correct posture, specifying desirable heights of desks and chairs. Desk heights had to be revised later to permit the use of superior techniques that would enable typists to sustain higher speeds. Many good and many inadequate copyholders were invented, but most of them failed financially even after intense advertising campaigns. Neither schools nor offices have paid much attention to the recommendations of competent authorities about such devices.

Next came the national typewriting contests, in which the rivalry of the typewriter companies concentrated attention on the scientific aspects of the training of the operators to a greater extent than ever before. A comparison of the rates of speed at which the early contests were won with those of the present time might be somewhat misleading

if all the factors were not given consideration. At first, the custom was to have someone buy several copies of a newspaper; then, an editorial article would be picked almost at random, and each contestant would be given a copy of the article. Naturally, the syllable intensity of such matter was usually much higher than prevails today; and the writers were handicapped by small type and closely printed lines. Some time passed before the contest copy was specially prepared and printed in large, clear type. The 86 words per minute, net, written by Miss Rose L. Fritz in winning the first world's championship in 1906, would probably be about 120 or 125 words per minutes, net, by the stroke method of count.

Growth of Teaching Methods. The first twenty-five years of the use of the typewriter were marked by much disagreement on the best method to operate the machine. Two elements were the source of discord: (1) the indecision as to the correct number of fingers to be used in operating the typewriter, and (2) the indecision as to whether typewriting should be done by sight or by touch. By 1891, experts had demonstrated the effectiveness of using all fingers, and a few schools were teaching touch writing; yet there was still disagreement as to the number of fingers to use. It was not until 1900 that all experts agreed on the superiority of the use of all fingers.

The first practice in typewriting was individual or text-taught and could hardly qualify as instruction. The teacher, if one was used at all, checked the copies that were typed. Group or class instruction was not thought of until 1905, when some progressive teachers began to experiment with it. General acceptance of the class idea did not come until 1916, when the demands of World War I forced the adoption of more efficient methods; and, as a result, huge classes were organized and taught largely by expert court reporters and general stenographers, all lacking teaching skill. These untrained teachers were followed by an influx of elementary school teachers who saw an opportunity to advance themselves in a new field. While they were trained in the theory of teaching, they were decidedly lacking in the skill of typewriting. The increase in demand for teachers of typewriting was much greater than the few training schools could supply. This hindered the development of a scientific plan of teaching.

Between 1895 and 1900, the general trend toward developing a systematic approach to typewriting began. As a result, the "keyboard approach" came and teachers became interested in methods for learning the keyboard, the formation of correct habits, and later, the psycho-

logical analysis of skill and the pedagogical organization of material. Teachers and authors soon found that the step from fingering practice to application practice was too big to be taken at one time. Since 1900, the three step pattern that has been dominant is (1) learn fingering (2) build some degree of skill, and (3) learn to set up properly arranged typewritten material. Each step in the pattern has undergone many changes, but their broad outline has come to be accepted as the fundamental outline for typing instruction, and authors now aim to provide material to implement them.

Three stages of development have occurred in estimates of how long a period of training should be required for the learning of typewriting. A period of indefiniteness existed until 1900. From 1900 to 1930, came an era in which formalized lesson structure evolved, with a wide diversity of course durations suggested. After 1930, a few durations became prominent enough to indicate a crystallization and refinement of standard length courses. This brought the four semester high school book of 250 or more period lessons and the 150 period book for the year's course.

The presentation of the keyboard, with a plan for its most efficient operation and with materials for its mastery, is one of the most distinguishing elements of any textbook. A prime factor in learning to type write is establishing correct association between the keys on the keyboard and the fingers that should control the operation of the keys. Two general approaches have been used—the physical and the mental. The physical approach features the automatization of finger movements without special mental effort. The student is told or shown that a particular finger controls a particular key, then, he is given practice material constructed to provide repetitive exercise of the new association. He makes no particular effort to memorize the all over pattern of key locations. The physical approach is a development of recent times. The mental approach is based on the belief that a learner must memorize the pattern of keys of the keyboard so that he can visualize in his mind the picture of the keyboard in order to direct his fingers to the correct keys without looking at the keyboard. This belief has been held by the majority of authors who contrived many devices to help or to force students to memorize the keyboard pattern. Many memorization aids are found in books published prior to 1930.

At least thirty two different patterns for assigning keys to specific fingers have appeared in textbooks. The essence of the patterns is their method of dividing the keyboard in zones for particular fingers to

control The finger zone pattern used almost universally in modern times was first presented in 1910 If fingers are consistently to control the same keys, some means must be provided to assure that the hands maintain a position from which the fingers can execute their assignments Most books have directed students to maintain a "home key" position so that the fingers can readily move up and down the diagonal rows of the keyboard This position has been known also as the *guide row position*, *home position*, and *base position* From 1900 to World War I, the use of guide keys (*a* and *,*) exceeded the use of home row keys, although the effect of their use was just about the same Since then, nearly all books have used the normal home key position

By 1920, a nearly universal system of keyboard control had been established The standard finger zones, the normal home key position, and the use of the right thumb for spacing won acceptance by 1930 and have dominated the practice in books since then Since 1930, the use of keyboard scales and supplementary practice has continued as the dominant practice pattern, but the character of the supplementary material has shifted from words alone to words and sentences, and the scales used have been simpler and more diversified Throughout the development of different practice patterns, the relative importance of single letter typing, single word typing, and sentence typing has been a center of difference among authorities

Prior to 1900, no definite pattern of sequences was discernible, since keyboards were arranged differently on machines From 1900 to 1940, the pattern of first teaching the keys on the second or home row bank, then the keys on the third bank followed by the first bank keys was the most commonly used Since 1940, the most commonly used pattern has been that of teaching the home row first, followed by presentation of the other keys in some order other than in diagonal rows or banks This pattern was introduced in 1906, grew in importance during the 1930's, and finally emerged as the most used sequence pattern of the last decade It had become evident to some that the student could not learn to use all his fingers at once in this home row method In 1902 Mrs Ida M Cutler contributed a revolutionary idea for learning the keyboard, which she called the "first finger first" method Her manuscript, "New Idea in Teaching Touch Typewriting" was submitted to the Gregg Publishing Company and was put in textbook form by Rupert P SoRelle The book was called *Rational Typewriting* and the method presented soon became known as the Rational Method Many teachers soon found that students acquired control of these first fingers

more easily and were relieved of the discouragement of the multifinger approach of the home row method. It was also obvious that it was easier to teach the keyboard in vertical sections than to teach all of it or rows of it at a time, and it was harder to train all the fingers at once than to train one at a time. Hence, this first finger first method has been a strong contender for prominence ever since.

Authors of textbooks have held at least seven different concepts of the relationship of speed and accuracy and the effect exerted on either of the two when the other is being stressed in practice. The first concept, that operating skill is determined simply by the fingering system learned by the student, was common only during the era when experts and authors were still debating the merits of different fingering systems—1880 to 1900. Once they agreed on the use of all fingers and touch control, correct fingering as the *whole* of typing instruction was no longer stressed. The second concept, that speed is a by-product that comes inevitably when one learns to type accurately, was dominant through 1909 and important through 1919. The third concept, that accuracy should be stressed, but that some formal attention should be given to directing students' efforts toward speed, grew from dissatisfaction with the second concept. This third concept originated just before 1900, grew in importance during the next ten years, and since has been a dominant concept in textbooks. The remaining concepts are refinements of this third concept, centering on the nature and extent of the attention given to speed. The fourth concept, that over-emphasis on accuracy (requiring all work to be repeated until it is done with perfect accuracy) retards the proper development of speed, is now generally accepted. It reduced the perfect copy requirement and substituted different devices for achieving accuracy without hampering speed development. The fifth concept, that speed development requires a formal, systematic program of materials and procedures in addition to abstention from the perfect copy standard, has become effective since it began in 1910. The sixth concept, that the development of speed requires not only a systematic program but also intensive effort by learners to force their speed higher, was initiated in the 1920's and has been accepted by the majority of textbooks. The seventh concept, and the newest, that accuracy standards be set aside temporarily during intensive forceful efforts to increase speed, began in the 1930's and has made rapid progress.

This evolution of teaching methods is largely responsible for the mass of conflicting opinions that still exist. Our so-called "modern

methods" are merely methods revived from the forgotten work of very competent pioneers in the field. Also, what may appear to be original ideas are not new or original. The practice of science is to build on the solid foundation of the past, and typewriting has likewise followed that practice.

The Course in Typewriting. *Its Universal Use.* The typewriter has become increasingly popular both for business and for personal use because it has decided advantages over longhand. Typewriting is much faster and more legible than writing with pen or pencil. This popularity has been reflected in increased enrollment in typewriting classes in public schools.

Types of Courses. Several types of courses are offered in typewriting, according to the proposed use of the course.

1. **Exploratory.** A short, six-week course offered sometimes in the eighth grade to predict the probable success of pupils in typing in senior high school.

2. **Personal-Use.** A course offered in the ninth or tenth grade to give pupils a writing tool more rapid and legible than handwriting. One semester should be sufficient, but most high schools offer it for a year.

3. **Vocational.** A course for training secretaries, or stenographers, or typists. It is usually offered for four semesters and in the tenth and eleventh or eleventh and twelfth grades. If offered in the tenth and eleventh years, it will better prepare the pupils for the transcription work in the eleventh and twelfth years. In the larger schools, a three-semester course may be offered, with the fourth semester devoted to an office practice course. The general opinion is that instruction in typing for vocational purposes should be offered as near graduation from senior high school as possible and that personal-use typing should be offered as early in the high school course as possible to make its use available to the student through high school.

4. **Business Practice.** A one-year course that will prepare the student for general office work where typing is a minor activity. Often, students enrolled in this course are drop-outs of the two-year vocational course.

Its Organization. The varying conditions in schools have not made it practicable to organize a course of study to fit the situation in each state; a few states, however, have developed and published bulletins of this kind. Some from another state.

Every well-planned course of study will have objectives that are stated and defined aims showing the end for which the course is

planned a content outlining the material to be used in attaining the goal sought, methods for using the content effectively, and outcomes showing the desired changes in student behavior. In a well planned and effectively taught course, the outcomes will result in the accomplishment of the aims of the course.

Its Aims A course in typing should have the following aims

- 1 To develop an understanding of and an ability to use the typewriter
- 2 To develop automatic, manipulative skill commensurate with the proposed use of the subject
- 3 To develop an understanding of and an ability to use the forms of type written expression in common use in business
- 4 To develop an understanding of and skill in the use of the mechanics of writing (punctuation capitalization abbreviation spelling, syllabication etc.) in common use in typewritten material
- 5 To develop the ability to use typewriting skill efficiently where language and thought must be expressed in typewritten form
- 6 To encourage those character traits that contribute to the highest type of business and personal relationship and to discourage those unacceptable

Its Objectives Nothing is more stimulating to a teacher than self criticism, and nothing more deadly than self satisfaction. Good teaching of typewriting demands that the teacher analyze his job and set up objectives for his work. Students will work more intelligently and with greater interest and enthusiasm if they have helped to fix the goals to be achieved and if these goals are kept clearly before them.

A progressive teacher must continually seek new ideas and constantly analyze the subject matter. He must frequently check on the work habits of each student and make suggestions to improve efficiency. The class period in typewriting too often tends to develop a passive type of individual when the student should be active aggressive, going ahead. The teacher should provide a stimulating environment, develop the work spirit and give students opportunity for problem solving and their best thinking. The students should feel at the end of each period that something definite has been accomplished yet the challenge is unfinished.

A clear understanding of the objectives to be used in teaching typewriting will aid the development of this type of instruction. These objectives should be in writing if they are to serve for the best professional thinking for course of study making for lesson planning and for good teaching. A set of written objectives that would be recognized authoritative by typewriting teachers should be formulated but unfortunately that has not been done. Every teacher makes his own

good or bad, unless his teaching is aimless. Until typing teachers do give serious consideration to the formation of comprehensive, valid objectives for their guidance, many teachers will continue to be misguided, to their own professional discredit. Such a statement of objectives must be formulated in very general, comprehensive terms to serve all the teachers in all the different kinds of schools or courses in which typewriting is taught. This complicates the problem and perhaps delays its solution.

The most complete set of objectives ever made for typewriting were those of Earl W. Barnhart, published in the *National Business Education Quarterly* for December, 1932. This set of objectives could be used by state, city, or school committees for preparing commercial curricula or typewriting courses of study. Only a few new ideas need be added.

Summarizing, the objectives in teaching typewriting are controlled by the aims of the course, they must be adapted to the methods of the teacher, and they must be fitted to the needs of a school or community.

Its Content. Regardless of the typing course taught, whether personal or vocational, the operating parts of the typewriter and their uses and the keyboard, must be taught first. The plan of teaching these will vary with the type of course and the maturity of the students. Below is given a general course content for the personal and vocational courses. These are the basic things to be taught. If other courses are offered, it is hoped the adaptation can be made.

Personal Use (one semester course)

- 1 Operating parts of the typewriter and their uses
- 2 Learning the keyboard
- 3 Some practice in connected typing
- 4 Some social correspondence
- 5 One business letter form and addressing envelopes
- 6 As much manuscript work as time will permit, such as
 - a Page articles, both single and double spaced
 - b Continued articles and a simple manuscript
 - c Cover and title page
 - d Table of contents
 - e Program forms
 - f Outline forms
- 7 Accurate, but not necessarily speedy, typing

Personal Use (two-semester course)

Add to the above the following

- 8 One or two more business letter forms
- 9 Practice in composing at the typewriter

- 10 Use of carbon paper
- 11 Simple tabulation
- 12 More manuscript forms, such as
 - a Half page booklets
 - b Menu and invitation forms
 - c Several page manuscript with footnotes
 - d Bibliography
- 13 Typing postal cards and telegrams
- 14 Devote some time to doing school or extracurricular work
- 15 Care of the typewriter
- 16 Development of average speed with reasonable accuracy

Vocational (four semester course for prospective stenographers)

- 1 Operating parts of the typewriter and their uses
- 2 Learning the keyboard
- 3 Mechanics of timesaving devices and care of typewriter
- 4 Practice in connected writing to develop smoothness and greater speed of operation before beginning form work
- 5 Thorough study of business letter forms from the standpoint of mechanics, with whatever practice is necessary to master the forms
- 6 Addressing envelopes and typing postal cards
- 7 Typing telegrams, bills, and invoices
- 8 Some of the essential forms for manuscript work
- 9 Mastery of tabulation work
- 10 Some legal work
- 11 Duplicating work, as carbons, hectograph and mimeograph
- 12 Direct dictation practice and composing at the typewriter
- 13 High degree of accuracy
- 14 Maximum speed

Its Outcomes The outcomes may be divided into two parts (1) knowledge to be gained—those experiences or acquaintanceships with facts or necessary information that one should acquire for the thorough understanding of the subject considered, and (2) skill to be acquired—that dexterity or mastery of motor and mental control that causes instant, correct, automatic mental and motor reaction or response to a given stimulus. One must have knowledge before skill can be developed. The textbook material plus the teacher's knowledge should provide the knowledge to be gained, and the information necessary for the skill training may be got from this book or a good methods course for typewriting.

The Teaching Emphasis Three methods of teaching emphasis are used in teaching typing (1) accuracy, or copy, as the objective, (2) skill, or technique, as the objective, and (3) speed, or power, as the objective.

With the first method, the emphasis is placed on producing copy that is usually without error. This method is outmoded and the situation it uses creates is absurd. It is slow, discouraging, inhibits skillful operation, requires skilled performance before the most elementary operative skills have been mastered, relieves the teacher of practically all creative teaching effort, puts the learning problem up to the student without teacher guidance, and sacrifices correct technique for a slow, cautious mode of operation due to fear of making errors.

Adherence to this method is due largely to a mental confusion as to the objectives in the learning stages of typing—the operative skill stage of learning cannot be detached from the application of skill to practical problems. Accuracy should be a goal to be striven for earnestly, but not at the expense of correct technique, and the attainment of accuracy comes later, after correct controls have been established.

In the early learning stages, the emphasis should be on the mastery of typewriter operation, without complicating it by the introduction of other factors. A fair degree of automatic skill in typewriter operation is necessary before any satisfactory progress can be made in setting up correct forms. If this procedure is not followed, students will be torn between conflicting aims—the one affecting the finding of the keys and the other affecting proper arrangement—and a good job cannot be made of either. When the student has learned to use the typewriter so that he writes confidently at a fluent stroking rate, the question of setting up copy in correct form is merely a minor skill depending on the judgment of the writer as improved by studying correct forms from an artistic or conventional point of view. Material can be arranged without difficulty if one knows how to use the machine, but it becomes a very complex and difficult procedure if the two must be combined before any operative skill has been acquired. Using technique as the first objective brings with it many advantages—motivation is much easier, progress is more rapid, and there is greater freedom in writing.

Speed is an ultimate goal—a result. If it is the whole teaching emphasis, students will be able to do only straight writing. The copy-emphasis students may know forms but have no speed. Either is a lopsided student with little promise of success in business. Speed becomes a problem only when technique has not been emphasized from the beginning.

Present Teaching Methods Uniformity of teaching methods in typewriting is neither desirable nor to be expected. The teacher who modifies an existing method or creates a new procedure is making a

contribution to a better understanding of how typewriting should best be taught

The method that is used in teaching typewriting makes no difference provided students are actually taught and not left to acquire their skill by copy work from a textbook. A method is but a device and cannot take the place of good teaching. A good teacher will take from all the methods the procedures he can use most effectively and adapt them to his needs.

CLASS DISCUSSION QUESTIONS

- 1 What proportion of the total high school enrollment in your state is taking typewriting? What proportion of the total number enrolled in business subjects is studying typewriting?
- 2 What is the curricular status of typewriting in the senior high schools in your state? What changes seem desirable in this respect?
- 3 What is the curricular status of typewriting in the colleges and universities in your state? What changes seem desirable in these schools?
- 4 What are the arguments for and against the teaching of typewriting in the elementary school? In the junior high school?
- 5 In what years is typewriting most commonly taught in the high schools of your state? How many semesters are usually offered?
- 6 In what years is personal use typewriting taught in the high schools of your state? How many semesters are usually offered?
- 7 In what years is vocational typewriting taught in the high schools of your state? How many semesters are usually offered?
- 8 Should a student take a semester of personal use typewriting and then transfer to vocational typewriting will he be handicapped confused or find no adjustment difficulty?
- 9 Why are objectives necessary in teaching typewriting? What difficulties are likely to be encountered if no objectives are set up?
- 10 Of what practical value to a teacher of typewriting is a statement of aims? How will the increasing emphasis of the personal use aim of typewriting affect what is taught in typewriting in the public high schools?
- 11 In your opinion what constitutes vocational efficiency in typewriting? What constitutes personal use efficiency in typewriting? What should constitute elementary school use efficiency in typewriting?
- 12 What are the typewriting employment standards in your community or nearby vicinity? What is the importance of a teacher's knowing this?
- 13 Give reasons why the typewriting teacher need not follow the textbook faithfully from beginning to end. How then can a teacher determine which items to teach and which to omit?
- 14 Should students be permitted to use the typewriters in periods other than the regular typing period? If so is it necessary that a teacher be in charge of the room during such practice periods?

15. Should students be permitted to use typewriters at home? If so, should they be permitted to do work for credit at home? Might it not be advisable to allow credit for homework in a personal-use course but not a vocational course? Give reasons pro and con for each of these opinions.
16. Which is to be preferred, single or double class periods for typewriting? If single class periods, then how much extra practice time should be permitted each student?

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The Learning Process

The Teaching of Skill Learning Method in typing is tied up with psychology and the study of the learning process. It is the procedure used by the teacher to meet his learners at their level and then to establish conditions to proceed toward the objectives in the best manner possible. In brief, method in typing is the application by the teacher of principles by which learning takes place.

The necessity for thorough mastery of the subject matter is fundamental in this learning process. Since mastery is necessary before a skill can function, the teacher must be a master of the learning problem involved before good teaching can take place and before the student really learns.

The first step in the solution of the student's problem of skill learning is the formation of habits that best initiate the skill. Yet, correct typing skills are not fixed habits, they are flexible, susceptible to change and improvement. Even the expert typist does not type the same material *twice with exactly the same techniques*. If his habits were fixed, this would not be true. So a skill must be an adjustable thing and must be taught as that. It is, therefore, important that teachers of typing have the knowledge and the mastery to build skills that may constantly be improved. To teach such ever-changing skills is not an easy task. It is challenging.

How Habits Are Formed Human beings are forming habits, from the first days of their lives, that determine the reactions they are able and likely to make in response to specific situations and stimuli. A typist's fingers, for example, are able to find the correct keys or to make the correct letter making movement because of the habits of response that have been established by previous practice. Thus, he may be able to avoid errors because of the finger habits he has acquired.

Nerve cells are highly sensitive to stimuli of every sort, hence, they are more easily modified than any other substance and have the power of conducting impressions set up in themselves to cells located in other parts of the nervous system. A nervous impulse so generated is conducted over long nerve fibers, through the spinal cord to the brain, where it is received by sensory neurones, whose activity gives rise to a sensation. From here it is carried over association neurones in the brain to motor neurones, from which it passes down the cord again to some set of muscles that produces a movement. All the neurones over which this nerve impulse passes are modified by the stimulus. The nerve impulse leaves an impression on the various cells composing the neural arc over which the current passes. This modifies them in such a way that, when the first neurone in the chain is excited again, the nerve current tends to take the same pathway and to end in the same movement. The normal result of every nervous impulse is some muscular response, that is, every nerve current once started seeks an outlet in movement. Such a movement may be started by stimulation of a sense organ or by an idea or purpose. But no matter where or how the nerve impulse starts, it seeks a way out and always prefers pathways that have been traversed. Thus a habit is formed.

The Role of Habit in Typewriting Acquiring skill in typewriting is often said to be a matter of forming, improving and fixing certain habits that enable learners to control their fingers and hands in accurately locating each key to be struck. Many habits are formed and fixed as skill is acquired, but their improvement or adjustment is the greater problem for both teacher and students. This is necessary before expert skill is attained. Certain habits should be prevented just as certain habits should be formed. The teacher must be constantly alert to detect these habits of incorrect method before they become fixed, as well as to aid the student in establishing those correct habits that make for a correct technique of operation. Certain low-order habits are acquired that must later give way to other higher order habits through a short circuiting process and make the writing automatic.

Difficult feats of skill or complex acts are acquired through a period of intense and often disagreeable effort. As the art is acquired, the unpleasant factors are eliminated and when the activities have become fairly automatic, pleasure attaches to them. Typewriting is a complex act, which as it is acquired becomes more and more enjoyable. The attitude the learner takes is a fundamental factor in the efficiency of the habit forming process, hence, the importance of insuring in the student

a strong motive for thoroughly mastering the learning process. The teacher who can successfully create the proper attitude toward the work is quite certain to accomplish good results.

The process of habit formation in typewriting follows the same principles that apply to other types of skill. First, there must be a clear idea of the way in which different units must work together to form the habit—teacher demonstration of the appropriate movements, with student imitation following, repeating it until they are conscious of the proper “feel” of the new adjustment. Without demonstration, the student will blunder about until he finally hits on a fortunate combination of movements that will meet his purpose. If he repeats it readily, the habit may be quickly established. The combination of movements constituting the desired habit must be repeated until the neurones are permanently connected. Attention must be given to the repetition, for mere repetition is uneconomical. Skillful teachers, recognizing the necessity for securing attention to the repetition, invent devices that will insure interest and relieve the monotony that lessens the powers of attention. The learner may be conscious of his failures and inadequacies in his practice work, but it is more important that his successful efforts be recognized and commended.

In establishing a new habit, it is essential that no exception to the desired behavior be permitted. In typing the learner should undertake only a few habit building processes of the same sort at the same time. This means the work should not be pushed too rapidly. The importance of the right start in learning any type of skill cannot be overlooked or overemphasized. In *Seven Speed Secrets of Expert Typing*, the authors write

If you start wrong you limit yourself and your earning capacity, if you ever learn the correct way, you must take valuable time to unlearn the wrong way and then learn over again. This unlearning and relearning is a most disagreeable and disheartening task. Not until one is faced with the evil effects of doing a thing in the wrong way can he fully appreciate the reason for learning correctly the first time.¹

The teacher and student should always remember that, as the first pathway is cut, subsequent nervous currents will be directed

Concentrated effort is also most important if good habits are to be formed. At times, the learner *must* put forth the greatest effort of which

¹ Harold H. Smith and Ernest G. Wiese. *Seven Speed Secrets of Expert Typing*. The Gregg Publishing Company, 1917, page 5.

he is capable. Intense effort generally brings the learner to a higher degree of efficiency, and thus gives him confidence to persevere until he can maintain it permanently.

The Role of the Teacher in Habit Formation Motivation which is necessary to habit formation, is the teacher's part in habit forming. But few people can learn typing without a teacher, and this is partly because a teacher is needed to provide the necessary motivation. Although a student may be interested in making the movements correctly, the repetition that is essential may be so monotonous that he resorts to incorrect methods which seem to bring quicker results. If he has the proper motivation, many more repetitions may be secured. The amount of repetition required for fixing a habit depends on so many things that it is unknown.

Teachers who have an understanding of the principles of habit formation will be able to direct their learners more efficiently than those teachers who are ignorant of their operation. Students should be interested in solving their difficulties, but teacher guidance may help to avoid many of them. A teacher should so direct a student's learning that he will feel he had a large part in it, which will motivate his future efforts. Students may achieve astonishing results under the pressure of teacher stimulation.

The Student's Capacity for Learning Learners differ greatly in their capacity for study and work, so it is most important that teachers adjust the task of learning to the mental and physical capacities of their students. The best results are obtained when the periods of practice are of such length as will give the greatest amount of exercise to the habits to be formed, with the least opportunity for fatigue. Special study and investigation must determine what are the most desirable periods of work and rest for any case of learning.

A scientific analysis of learning to typewrite shows that all practice taken when learners are nervous or fatigued is not only worthless for strengthening the habits to be fixed, but is also positively injurious, because it prevents the origination of more efficient methods of work and favors the formation of wrong habits of mind and hand that must later be eliminated if further gains are to be made. All typing habits and the more economical methods of control developed in the course of practice do not operate so readily upon first beginning to write as later in the practice. This means that a little time is required at the beginning of each day's practice to revive the associations to be used and to acquire the most helpful mental set for the work. A skillful teacher will

never crowd his students at the beginning of a lesson, but he will see that old associations are carefully revived by slower practice. Neither will he try to force his students on their "off days" or before they are well warmed up, but he will see that maximum effort is applied when the conditions are favorable for taking such forward steps. Therefore, a teacher should urge his students to greater endeavor when the mental and physical conditions are favorable and use more leisurely application of effort when conditions are unfavorable for taking forward steps.

A Psychological Order Necessary. There is a natural and correct order of acquiring the special habits to be formed in any instance of learning, and there are many unnatural and wrong methods of acquiring them. The development of various habits acquired in learning to typewrite is something like the movement of a flock of sheep along a country road. The whole flock moves forward, now faster, now slower, while first this sheep and then that particular sheep pushes ahead of the rest. So in learning to typewrite, all the habits to be acquired are being developed almost from the first. Over this array of possibilities of improvement, the learner's attention moves—focusing now on this or now on that particular phase of the work, causing an adaptation to be made, first in this and then in another part of the work, producing great irregularity in the development of the various habits to be acquired.

The most economical way of cultivating these habits is to let them grow and develop together as far as possible. Letter habits are best improved through the use of word habits, even as the latter are dependent on the perfection of the letter habits that are combined to form them. Students of typewriting should always practice with the highest order of habits that they can use successfully. The teacher must determine this most natural and economical order of acquiring the habits and must arrange the instruction so that the most efficient method will be followed throughout the practice. The only way to obtain such an economical and efficient method of directing learners is to get and utilize the facts revealed by a complete scientific analysis of the learning task.

The Kinæsthetic Sense. The general belief is that the operation of the typewriter without the aid of the eyes depends on a sense known as the "kinæsthetic sense." This sense enables a person to judge the position and movement of his limbs. For example, in sitting at a table he may move his foot and be conscious of the approximate distance or direction of the movement without looking under the table.

"Kinaesthetic" is derived from the Greek words *kinesis*, meaning "movement," and *esthesia*, meaning "physical sensibility", the term was first used in 1869 by Dr H C Bastian to express the memory of movement. Now it is used to mean the perception of muscular movement. All muscles, tissues, joints, and tendons are provided with sensory nerves, which, when stimulated by contraction, carry excitations to the brain that result in sensations of movement. The recurrence of these sensations of movement develop "kinaesthetic memories," and when the memories become sufficiently vivid, the perception of muscular movement results.

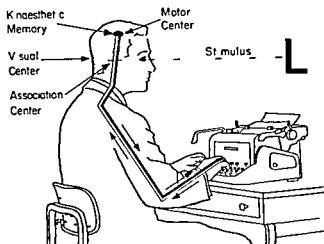
What Produces the Stimulus? All objects are seen by means of the rays of light that are reflected from the objects. These reflected rays (in typewriting work, from the page of the copy) pass through the eye and are brought to a focus on the retina (a nervous membrane at the back of the eye). An inverted image of the letter is produced. When these reflected rays of light strike the retina a stimulus or visual impression results because the retina is made up of nerve ends, all of which collect into one large bundle of nerves at the base of the eye, called the optic nerve. This optic nerve goes directly to the visual center of the brain. Here the inverted image is righted, and when the impression reaches the thought or association center, one knows or is conscious of the object or letter seen.

Registering the Movements The accompanying illustration shows the mental process involved in the learning of typing and how that process becomes automatic.

The stimulus from the printed letter is carried by the optic nerve to the visual center of the brain, from there it passes to the association or thought center, which directs the motor center to send out an impulse to the muscles for the writing of the letter, this impulse goes through the spinal cord and the arm to the desired finger, which strikes the desired key. These pathways are shown by the arrows on the light and heavy black lines. The movement of the finger in striking the key causes an excitation to return to the brain (path shown by the return line), where a *memory of the movement* is registered in the vicinity of the motor center (see shaded area). Thus memories of the whole keyboard are in a similar manner, developed, registered, and fixed.

After these memories of movements are developed and fixed, the operation of the typewriter keyboard becomes purely automatic. That is, whenever the operator, in the future operation of the machine, thinks of, sees, or hears letters or words for which he has developed and fixed

memories of movements, these are revived. The stimulus to the visual center revives the proper memory of movement, without the aid of the thought or association center. The registered memory of the desired movement sends an impulse to the motor center, and from there the impulse is discharged through the fingers. This process leaves the thought center free to do other thinking, for the typewriting has now



INITIAL MENTAL STAGES OF LEARNING TO
TYPE THE LETTER L

become direct, automatic, motorized, mechanical, or subconscious, and is consequently more accurate and efficient. This should explain the common opinion that typing requires no thinking. It requires conscious thought until the memories of movements have been built up. Thus typing demands that the learner think in the early stages; it may be mechanical after the word habits are built. Automatic typing is expert typing, as in other skills.

The beginning stages require the use of the thought center to such a high degree that no work is possible on the machine without its use. As the registered kinaesthetic memories increase, they take over the work of the thought center more and more. When the memory of the movement can be recalled from this kinaesthetic memory center, the thought center is not used and the typing becomes automatic, motorized, subconscious, mechanical. Whenever difficult or infrequent words are met in the writing, the typist must resort to the single letter response plan of writing.

Patternism in Typewriting Although experimentation has failed to provide detailed characteristics of patterns in typing, it has revealed certain frequently recurring phenomena, the clusters of which showed rhythm patterns, movement patterns, spatial patterns, and word and

sequence patterns. Experimentation established the fact that expert typists do not write on the letter-by letter, specific stimulus, specific response level. Typing involves the automatization of spatial patterns that are best learned by visual, tactual, and locomotive experiences.

The learner in typing must analyze the motion pattern of the expert and develop in himself that pattern. All efforts, both of teacher and student, should be directed toward developing in the student a concept of what that pattern is. These typing learning patterns vary in each of the three typing learning stages. A beginning typing student learns fastest when he discovers there are definite patterns to follow in learning specific typing skills. The first patterns for him to learn are the manipulative movement patterns, like carriage throw, which must be followed exactly until a complete action pattern becomes automatic. The teacher sets the pattern as he demonstrates, the student performs it until automatization takes place. In the keyboard learning stage, a body of efficient movement patterns is developed for all letter sequences that occur in words. These word pattern sequences may reduce the time needed to learn the keyboard. Thus, throughout the remainder of his learning experience in typing the student should create in himself the action patterns of the expert. He should strive to transform his movement patterns from the clumsiness of the beginner to the ease and smoothness of the expert. The psychologist can show him what procedures in his learning have not been successful, and the teacher can suggest how he can best direct his efforts, but in the final analysis the learning is up to him. No one can learn for him. Good learning concentrates on the pattern of action rather than on the results.

Psychology Applied to Typewriting. Every teacher of typewriting should study the underlying mental and physical processes through which the learner must be trained if the subject is to be taught effectively and intelligently. The teacher should be acquainted with the general principles that psychologists have discovered about habit formation and motor learning.

Learning to type by touch follows the laws of learning used in similar mental and physical actions. An analysis of these actions can be reduced to the statement that seeing a particular series of printed marks arouses particular associations which result in a particular series of muscular movements. Briefly this says that a specific stimulus will be followed by a specific motor response. Therefore, for the stroking of each key on the typewriter, there are corresponding stimuli and associated muscular movements. The whole process of learning the key

board requires a definite, precise muscular movement to be ready always to respond to the stimulus. These are two phases of one act and must be knit together as one. Unless this is done, the two do not have the relation of stimulus and reaction, which is necessary for accuracy and speed in typewriting.

Investigators in the field of psychology agree that the learner should be given a clear understanding of what he is to do and exactly how he is to do it. This includes not only a general idea of how each movement must be made but also a definite idea of the movement as a whole and the kinaesthetic impression of how it feels to make the movement. Emphasis should be placed on the sensations of muscular movement as each key is struck as well as on the contact sensations. The teacher should strive to have the student's body, arms, hands, and fingers where they should be when the student is asked to note sensations that accompany a movement.

An understanding of how the movement is to be made must include not only a visual impression as a preliminary, but also a sensory impression. Attention to these sensations is developed by some teachers, who, at each stage of the movement, direct the student to notice the finger and how it feels as that part of the movement is being made. Attention may be called to the sensations from the adjacent fingers and the entire hand. Such drills are especially important when reaches to and from the first, third, or fourth rows of keys are to be taught.

Every voluntary, muscular reaction in typing has a certain accompanying mental process, including not only the mental process that stimulated the action, but also certain additional mental processes that may accompany or follow the execution of the action. The speed of mental reactions largely governs the speed of writing in typing. The beginner sees a certain letter and recognizes it before making the proper finger movement. He has, then, a separate stimulus, thought, and reaction for each finger movement, whether for a letter key, the space bar, or any other movement. The speed of writing at this stage is governed largely by the sum total of the time required for all these processes. Increasing speed is a matter of decreasing the time required for these processes. The finger movement itself usually requires but little time; so, for the average student, the problem of how to increase speed is usually the problem of how to increase the speed of the mental reactions.

The solution of the problem of how to increase accuracy is to make the connection between the stimulus and the reactions more positive

and to eliminate any mental processes that may interfere at any stage of the process. Students should be watched for any signs that indicate that unnecessary mental or physical associations are developing. They should be encouraged to make the necessary motions quickly and to act with as little conscious mental activity as possible.

As practice co-ordinates muscles so that a given movement can be made with minimum effort, so does repetition co-ordinate individual finger movements into larger units that are executed as wholes, or as established sequences that require but an initial stimulus to set the entire cycle in motion. For example, in writing the word in the beginner must think of each letter and then write it, but the experienced operator thinks of in only, and the three necessary motions are made in a pattern of movement as a result of the single thought impulse. This is the goal for all would be typists—a single thought impulse or motion pattern for as many words as possible. This produces word habits and is called a “motorized vocabulary.” Individual letters in the word are not seen or written as such, the word is written as a whole, and the thought of the word is enough stimulus for whatever succession of strokes is necessary to make the pattern.

This word habit process may be extended to whole sentences, and even to paragraphs. Expert typists have large motorized vocabularies and familiar sentences that they write with only a thought stimulus. The thought of the sentence sets up the flow of motions necessary for its writing. Motor habits, for as large a vocabulary as possible, are the only guarantee of high speed with accuracy. These word habits start early and are built up by degrees. Practice and intensity of effort apparently dictate what particular words will be motorized first, but difficulty and frequency of use are also important factors in determining the words to be motorized. The student begins with short, familiar, frequent words and then progresses to longer, less frequent words or phrases.

The teaching process should attempt to parallel this learning process. Students should pass through the individual letter stage with as few associations as possible, so that the transition to the word or group writing stage can be made without a great deal of unlearning of unnecessary associations. When the time seems proper, the teacher should encourage the students to write the most common two stroke words without conscious thought, that is think the word and think nothing further, leaving the mind a blank until the fingers have finished. Then, longer words, until the process is extended to as large a

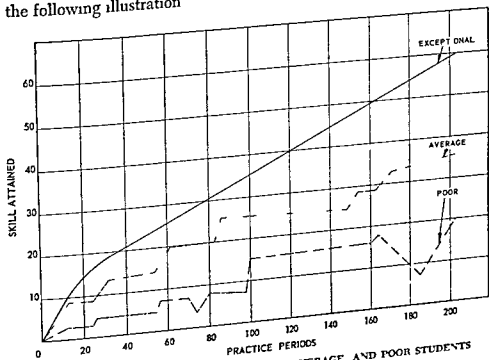
vocabulary as possible. If students make many errors, this is evidence that they have not developed the elementary single reactions to such a point that they can execute these more complex habits. If errors are made on four-stroke words, while very few are made on three stroke words, this is evidence that the students are being forced on to longer words before they have developed the connections that enable them to execute so complex a series. This building process proceeds by slow degrees and comes only after much practice.

The ultimate results of this learning process are evident in the finished typist when word habits have been established for practically all words that are written. Only the unusual word must be written in an elementary way, and this may be written on a syllable basis rather than on an individual letter basis. Because of these extensive word habits, the professional typists have been able to carry on conversations, do arithmetic problems and similar "stunts" while copying at high speed. The writing has become automatic because the word habits include most of the words necessary for writing ordinary matter. When copying entirely strange matter in an unfamiliar vocabulary, the word habits do not function sufficiently to permit such stunts. These typists cannot spell very well while copying, for consciousness of the letters in the words to be spelled interferes with the habitual writing of the words to be copied.

When the student has reached the stage where he has a very large word habit or motorized vocabulary, his conscious mind, or thought center, is free to think along lines that do not interfere with the writing processes. At this stage the conscious mind begins to grasp the meaning of what is being written, just as the meaning of material that is read aloud may be grasped even though what is said may not be heard. The writing process has been almost completely taken over by the subconscious mind, while the conscious mind is somewhat free. Thus, the subconscious mind is able to do the writing while the conscious mind is free to do whatever thinking may be necessary, just as one walks along the street talking to a friend, letting the subconscious mind take care of the walking process while the conscious mind is carrying on the conversation. Of course, when a new word is to be written, the conscious mind is called upon to take over the work of recognizing and writing the unfamiliar combinations. When the conscious mind becomes too conscious of what the subconscious mind is doing, or when the conscious mind begins to think in the same terms in which the subconscious mind is working (as in spelling), confusion results.

This automatic word habit stage should be developed as soon as possible, for much of the thinking about typewritten forms arrangement, etc., cannot be done while the student is still so conscious of his writing. Transcribing cannot be done at even a fair rate of speed if the word habits are not extensive enough to permit the conscious mind to solve the problem of reading shorthand notes sentence structure, punctuation, capitalization, etc. encountered while transcribing.

The Learning Curve At the outset of developing a new skill like typing, the rate of learning is rapid. Then the progress becomes slower, usually showing periods of no improvement sometimes with periods of relapse when performance recedes from previous high to lower levels. If the learner is intelligent and persistent in his effort the periods of no progress may give place to periods of rapid growth. Thus periods of growth commonly alternate with stationary periods giving rise to what is technically known as the practice or learning curve. This curve pictures graphically the growth of the habit or skill from its beginning to a point where it represents a reasonably perfected form. The initial growth is very rapid the later growth is relatively slow then the curve gradually flattens out, representing the plane of maximal efficiency in the habit or skill. The practice or learning curves of exceptional, average, and weak students would look something like those in the following illustration.



THE PRACTICE CURVES OF EXCEPTIONAL, AVERAGE AND POOR STUDENTS

The portions of the curve representing the intermediate periods of no growth, or of actual loss in progress previously made, are known generally as "plateaus." They have also been called "stationary periods," "rest periods," "breathing places," and "absorption periods." Each term bears a significance to either the form of the curve or its imputed significance.

The Causes and Influence of Plateaus The periods where growth is slow and halting, or nonexistent, are critical for the learner, since he is likely at such times to become confused and discouraged. He is even liable to give up entirely the discipline essential to further growth. In practically all subjects involving habit formation, the initial stages are interesting—first, on account of their novelty, and, secondly, because of the relative ease with which some skill may be attained. There comes a period, however, when difficulties increase, and progress is greatly retarded, if not halted entirely. It is a matter of controversy among psychologists whether these plateaus of growth are really essential in the practice curve, or whether they may not be avoided if proper precautions are taken.

Plateaus in the performance curves of learners of typewriting may be caused by slumps in attention and effort that naturally occur at that stage of advancement where letter habits are being finally fixed and word habits are being mechanized. These periods of arrest are often prolonged because the learners increase their effort when the failure to improve is noticed, but they fail to apply this effort correctly because they center attention on speed instead of on the details that enable them to make correct responses for that stage of skill. The most significant fact about these slumps in attention and effort and the difficulties to which they naturally give rise is not that they occur and produce these temporary and permanent arrests in the learner's progress, but that they can be successfully prevented and overcome if the right kind of direction is given. To give such helpful direction, a teacher must know the exact cause of the learner's difficulties as well as when they tend most strongly to occur. All the difficulties in the learning can be successfully met and prevented if the teacher knows the exact kind of direction and help his learners need at the critical stages of advancement where the plateaus tend to appear.

The plateau is the most troublesome of the variations in a learning curve. The five main causes of plateaus are (1) fatigue, (2) discouragement, (3) inattention, (4) slumps in effort, and (5) changing from unit writing to group writing. A plateau can be shortened by

studying its cause and applying the following steps (1) carefully supervise the work, (2) stimulate self-confidence, (3) encourage perseverance, and (4) avoid discouragement. It is best of course, to prevent the plateau, if possible. This can be done by (1) carefully planning or graduating work, (2) giving the right kind of direction, (3) being on guard to recognize student difficulties, (4) applying the proper remedy before the difficulty becomes chronic, and (5) avoiding fatigue and overwork.

CLASS DISCUSSION QUESTIONS

- 1 Why is it important to start the formation of any desirable habit with a demonstration of the simplest and most effective movements? What are the major reasons for teacher demonstration?
- 2 Discuss the effort that is made by a teacher in breaking up undesirable habits. Compare this with the time and effort spent in the positive process of building desirable habits.
- 3 Of what value is repetition in skill building? What is meant by "attentive" repetition and what is its significance to the habit forming processes? How may the teacher insure that the student is attentive to the necessary repetition?
- 4 Why should the student not know too much about the psychology of skill?
- 5 Why are "exceptions" unfortunate in habit forming?
- 6 What is a learning curve? Is the learning curve for typewriting convex or concave in shape? Why?
- 7 What is a plateau? By what other names may it be known? What may cause a plateau? Prolong it? Shorten it? Prevent it?
- 8 What is the kinaesthetic sense? How does it relate to typewriting? Give some examples of its use.
- 9 What is the tactile sense? What use is made of it in typewriting? Explain what is meant by "tactile and kinaesthetic sensitiveness."
- 10 Trace the process of writing a letter from the printed characters on the page until the memory of the movement is registered.
- 11 What produces the visual stimulus? Since the image on the retina is inverted where is it righted and where does recognition occur?
- 12 How is an auditory stimulus produced? Does the writing process vary beyond it? Why should typing be learned from a visual stimulus?
- 13 What produces the writing stimulus when a typist composes as he types? Give examples of the use of the three kinds of stimuli in typing.
- 14 What is a motorized vocabulary? What determines the words to be motorized? When does motorization begin?
- 15 Why is transcribing a more complicated process than copying? Why should transcribing be delayed until some skill is developed?
- 16 What are some of the characteristics of the action pattern of the expert? Why must the teacher be able to recognize its components?

- 17 What degree of skill should a teacher have to teach typing successfully?
- 18 When can it be said that a skill has been mastered?

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The Teaching Process

The Need for Trained Teachers. Since most of the early learning of typewriting was self-taught, such direction as was attempted by the majority of teachers lay almost wholly in the field of knowledge and attitudes. As the teachers acquired a better personal skill, there was a growing tendency to include direction in skill, also. Without personal skill, the individual teacher was reduced to a dangerous dependence on tradition, guesswork, and hearsay if attempts were made to direct the typist's acquirement of skill. In proportion as the learner is directed by a competent, well-trained teacher, improvement in typewriting may be expected.

The modern teacher thinks of learning as a creative process, which, when started, grows and changes as the learner sees the purposefulness of his task. The teacher studies his students while the students study typewriting. This is a more difficult task than checking errors on papers, although some of that must be done. The school of today demands a well-trained teacher, who can select the best from the teaching methods and devices and weave it into an effective teaching plan, and who is willing to make continuous changes and adaptations.

The Development of the Text Material. Each textbook author thinks his work is a step forward, but a careful comparison of texts published between 1880 and 1900 will convince any unprejudiced person that all books have much in common. In his recent study of the development of American typewriting textbooks, Dr. Alan C. Lloyd¹ found that three background factors have had great influence on the characteristics and development of typewriting textbooks: (1) the typewriter—its

¹ Alan C. Lloyd, "The Development of American Typewriting Textbooks," Doctor's dissertation, University of Pittsburgh, 1951.

introduction, early promotion, and mechanical changes, (2) typewriting technique—the gradual emergence of an efficient method of type writing, and (3) typewriting instruction—its introduction and popularization in schools

Since the invention of the typewriter, 477 books were published in this country up to 1950, the peak of publication being in 1927. Books steadily grew in size. The pattern of development has been toward a larger, standard sized page. The practice of top binding was introduced just before 1900 and has been nearly universal since 1905. Since 1923, most publishers have used some kind of double hinge binding for thick typing books. Spiral binding has been used successfully for the smaller books.

The intrinsic values in a typing text are derived from two sources: the contribution of the author and the contribution of the publisher. The author's knowledge of the subject, his familiarity with the problems of instruction in it, and his competence in writing determine the contribution he makes. The publisher's additional information on the subject, his knowledge of the needs and demands of the users of the books, and his experience in book production and distribution enable him to assist the author in placing before the public a textbook that will merit their approval.

The development of typing texts is characterized by the marked extent of repeat authorship and the great number of contributions by a few prominent authors. The great majority of the authors have had experience in teaching typing, and, as a group, the authors may be considered as educators of high professional status and as writers of professional competence. The earliest textbooks include direct appeals to everyone who might be interested in learning to typewrite. As more and more schools began offering typing instruction as the course durations lengthened, and as the scope of instruction became more nearly standard, specialization in school centered books became practical. Authors responded by adjusting their aims to the school situation in general, without distinguishing between levels of instruction. Texts specifically intended for high schools, evening schools, junior high schools, and colleges have been introduced since 1914. Since 1925 books that focused on particular levels of instruction have outnumbered the books for general usage. The first book to exclude business schools and use the term "high school" appears to have been SoRelle and Cutler's 1916 edition of *Rational Typewriting*. From 1916 on, authors' attention to the high school field became more and more pro-

nounced, until now it has come to be the most prominent single center of publishing interest. It was not until 1930 that a text was published that used the word "college" to identify it. D. D. Lessenberry, in his college edition of *20th Century Typewriting* (1930), appears to have been the first to have prepared two different presentations to fit the two different needs—high school and college.

The organization of a textbook is the pattern by which the material in the book is arranged for instructional purposes—it is the general outline around which the author has constructed his book. By analyzing a book's contents—giving particular attention to the headings and terminology that appear in the running text, to the author's statements in the preface, and to the structure of the table of contents—it is possible to reconstruct the outline used by the author of the book. The early textbooks were loosely organized. Since 1920, virtually all books have been completely organized, with few new developments in the extent of organization but with refinement in methods of presenting application materials. In the seventy years that typing texts have been available, the lesson has emerged as a period length series of learning activities suitable for a group of learners to do simultaneously. The modern day lesson is accompanied by a complete outline and time table for the guidance of both teacher and student. The period between 1900 and 1920 marks the emergence of the budget plan of organization as an intermediate step between chapter and lesson organization, and 1920 to 1930 brought recognition of the importance of the lesson as the basic unit of organization. Since 1929, the budget plan has faded, and now all books contain lessons designed for classroom concert use, and many feature detailed lesson plans.

Since the purpose of learning to typewrite is to apply typing skill in the preparation of many kinds of material, nearly all texts make some provision for instructing students on how to arrange such material properly, how to solve specific problems involved in making correct arrangements, and how to build some degree of expertness in the production of typed material. The provision made for experiences in applying typing skill is determined by the presentation of illustrations, instructions, directions, and exercises for the learner to study and practice. There are five major kinds of experiences: correspondence, tables, business forms, a wide variety of manuscripts and forms associated with them, and legal documents.

Correspondence has received the most consideration. Tables have gradually been given added attention. Manuscript forms increased

sharply after World War I and have now become second only to correspondence. After 1919, attention to legal forms decreased rapidly.

Application exercises of all kinds are presented variously (1) as facsimile illustrations, completely arranged and shown in typewriter type, (2) in print type, with all elements of the exercise presented in a semblance or at least the sequence of the typewritten product, (3) in rough draft form, in which a facsimile illustration, with indicated corrections to be made, is provided, (4) in handwriting, and (5) in unarranged printed form, with some elements missing or with elements provided in a way that does not suggest the solution of the typing problem involved.

Standards for application exercises are closely associated with provisions for building proficiency in the applications of typing skill. The perfect copy standard has been used most, while the requirement of meeting time limit standards has had much less support. Some books make no statement about standards, leaving the question entirely up to the teacher to provide other means of developing and motivating the growth of application proficiency.

Until 1930, indented letters were the most popular form. They still appear in more books than any other form. Inverted address (in formal) form appeared first in 1892. The semiblock was first introduced in 1907. It is rapidly increasing in popularity, having been the most prominent in the 1940's. Modified block was first introduced in 1909. Hanging indentation or inverted paragraph, introduced in 1914, is used in a display letter, providing special display to the first words of each paragraph. Extreme block was introduced in 1915, interoffice memorandum, in 1918, and the personal letter, in 1919. "Close" punctuation has been by far the most prominent punctuation pattern. Since 1924, it has lost place to "mixed" (punctuation after the salutation and complimentary close only). "Open" punctuation (omitting all punctuation at ends of lines) has been gaining consistently but has not been dominant. Until recently instruction in letter placement was given through the use of arbitrary points, keyed facsimiles, or general discussion of artistic appearance. Now, emphasis is on the use of reference tables or formulas that provide margins for letters of different lengths.

Every typewriting textbook is itself a teaching and learning aid, and it is the author's intent that it should be. Systematic review, explanations and motivation, and innumerable new learning helps have been incorporated in texts in recent years to replace the old, rigid demands for perfect accuracy and specific speeds. The pattern of development in

typewriting textbooks has consistently moved from the vague to the definite, from the general to the specific, from the haphazard to the focused, from the brief and cursory to the intensive and systematic, and from the individual to the classroom group.

Principles of the Best Teaching Order. The teacher should be free from ancient notions and traditional teaching methods. The items to be learned should be arranged in the order of "learning difficulty," and not of "doing difficulty." This requires a thorough understanding and application of all that is known concerning the learning process. The student must be taught how to place his mind and body in the proper state of readiness to learn. He must know his immediate objective. He must realize that skill can come only through practice and that use of a skill retains or improves it. He must recognize the best conditions under which improvement will continue. He must know how often and at what intervals his skill must be recalled; and, above all, he must know to what practical standard each skill is to be improved. At no point in the whole training program is the teacher's responsibility so clear-cut. Administrative and equipment problems may often be charged to the ignorance or mismanagement of school officials; subject-matter difficulties may be blamed on poor textbooks; but the first task of every teacher is to help each student who really wants to learn to typewrite to set up right study and practice procedures.

Psychological Principles to Be Used. There are definite psychological principles that underlie the acquisition of typewriting skill. Since the first steps in any new experience are tremendously important, and since initial success is absolutely imperative for the best progress, the more the teacher and the student know of the fundamental principles applicable to their problems, the more likely they are to begin and to proceed intelligently.

Habit. Since learning to typewrite is largely forming certain habits, the degree of complexity and automaticity determines the degree of skill. Therefore, the psychological principles of habit formation are most important to teaching typewriting. A teacher cannot be successful in training typists unless these principles are understood, for they are really factors that condition the rate and character, and fix limitations on improvement. Eternal vigilance as to what is permitted to impress and the reactions allowed is the price of good habits.

Concentration. This term is employed by many teachers, but it conveys little meaning to the student. It means centering the mind on the primary object of attention to the exclusion of everything else. All ele-

ments of the classroom situation must be conducive to concentration—temperature, light, ventilation, health, clothing, posture, and suitability and condition of equipment. Concentration makes it possible to get a deep impression of each movement and facilitates making that movement again. The first efforts in concentration may not be successful, but the ability to keep the mind definitely on an objective will grow as concentration is practiced.

Interest and Enthusiasm Most beginning students are interested in learning to type, in fact, they come with an initial enthusiasm. The teacher may unintentionally destroy or diminish this by imposing ultimate standards of performance too soon. When students get the proper start in typing, they usually find the work interesting. The effectiveness of the learning is greatly increased or decreased by the interest stimulated by the teacher and caught by the student and by the enthusiasm that the teacher maintains for the work. The teacher's attitude should encourage sufficient enthusiasm to stimulate interest and to motivate the student's work. Such student activity may be accomplished under the careful guidance of a wise teacher.

One of the most important factors is the intensity and persistency with which the student's desire for success is held in mind. If he is genuinely interested in making further gains and believes continued improvement is possible for him, he puts more energy into the work, he is able to direct the work more easily and correctly, he is not likely to settle down on a plane of writing that is below his best performance, or he is not likely to use habits of control and work that are less economical than those used at his best periods of work.

Interest in improvement makes a learner vary his responses and invent better methods of work. Interest in improvement and belief in success seem to produce an attitude of mind that affects directly and favorably not only the process of originating new and more economical methods of work but also the ease with which the older associations and habits work. When a keen interest in improvement is aroused, or when a learner is confronted by grave necessity or by some strong need for greater skill, a ceaseless experimentation is begun that is continued until a more economical method of work is originated. Interest in improvement produces progress in learning by making it possible for learners to select more promptly and to continue to use the most effective methods of work that their desire for improvement makes them invent. If a student really believes that there is a better way and is interested enough in finding it, he will somehow discover and use it.

But without interest in improvement and belief in the possibility of further success, that cannot happen. If it does happen, there is no basis for the selection of the better method of work because the basis for judging what is best to do has been removed.

Competition in typewriting can do a great deal toward creating and maintaining interest. The rivalry need not be between students or groups or classes alone, for competing with oneself or one's past records is a motivating force. But competition should not be used as the only interest factor. The student's interest, when rightly appealed to, does not have to be "aroused," nor does interest have to be "created." Teachers must remember that what the teacher feels is not of value, but what the student feels is of value and will appeal to his interest.

When classes are disinterested, the explanation must be sought—not in the students, but in the teacher, his methods, or the subject matter. The aim is to secure change and variety without losing sight of the real purpose of the work and to plan for a pleasant surprise now and then without lowering the value of the instruction. The teacher's enthusiasm must be real—sham or pretense will not serve.

Interest and Attention The things that make an impression are the things to which attention has been wholly and completely given. The teacher's first and most persistent aim in the typing period is, therefore, to gain and hold the highest possible degree of attention. Where there is interest, there is attention, for what the student feels is of value is what will appeal to his interest and gain his attention. When a student is not interested, he not only learns very little, but he soon becomes a disciplinary problem.

Variety or change is an essential factor that attracts and holds attention. While there are certain matters in the class hour that must become routine, yet there is a wide range of variety possible in much of the procedure. Singsong rhythm drill does not tend to keep the attention focused where it should be, but change in intensity, in tone of voice, in classroom procedure, in materials used is a strong factor in holding that attention. Change produces attention, monotony kills it. The great thing is to secure change and variety without losing sight of the real aims of the lesson. Interest is contagious. An interested and enthusiastic teacher is seldom troubled by the lack of interest and attention of his class.

The span of attention is vitally connected with the gaining of proficiency in typing. It has been proved experimentally that one can bring himself to grasp at once, or recognize at a single fixation of attention, as many as four letters in letter groups not forming words, as many as

three or four average words, and phrases containing as high as twenty letters. A teacher should realize that growth in typing skill depends on widening the span of attention. At the beginning of the learning process, conscious attention is given to each letter and its response. Then the student learns to widen his span of attention to short words or letter groups and then to longer words and phrases. The practice of giving conscious attention may become a habit, the value of which is of significant importance, for many routine tasks must be performed many times after their newness or attractiveness has worn off.

Effort should be made to prevent distractions of all kinds. Careful planning and good management can eliminate many distractions common to the typing class hour. Students talking to each other or aloud to the teacher, interruptions by the teacher for additional explanations—all serve to distract the student's attention from his work. Even the teacher himself may be distracting because of some mannerism or personal quality that attracts attention to itself.

Pedagogical Principles to Be Used. A student can learn some things better if he is not bothered by too much teaching—and this is true in typing. On the contrary, some things in typing must be taught vigorously and systematically. Being an expert typist does not insure the ability to teach it. Acquiring the technique of operative skill on the typewriter does not develop the technique of teaching the subject.

Drill. The principle of practice or drill is perhaps the most emphasized principle in typing instruction. The drill of the typing student may look aimless, but it has for its chief purpose the development of motor control through the automatizing of motor and mental associations. Wherever automatic action is required, there drill is demanded. Drill provides for the repetition of the mental or physical act until habit has made the act second nature and it is performed without conscious effort. A high degree of skill cannot be acquired without drill, for the brain requires a certain amount of repeated action before it can carry out the necessary operations without error and without the application of conscious thought.

The first step in a successful drill is to supply a motive for the drill. This is necessary to secure alertness and effort. Mere repetition is not drill. The learner must give himself wholeheartedly to the work so that he will feel a real need for mastery. Drill, to be effective, must not stop short of thorough mastery. Better results would be obtained in typing if teachers would require less material, select their material more wisely, and then drill on it until it is firmly fixed. Haphazard

practice is not effective. Wisely selected, co-ordinated practice brings results.

Making Assignments. Much of the success of instruction depends on skill in making assignments of work to be done. This means that the teacher must be perfectly familiar with the material to be assigned and must know just what points are to be stressed, what will present the most difficulty, what will most appeal to the student's interest, and what will need to be discussed or explained. When the class understands the material, then a statement of just what the class is expected to do should be made.

Individual Differences. The principle of individual differences is always present in the typing classroom, even from the first day. There are the clumsy or the awkward, the self-conscious or the timid, as well as the skillful operator having ease and confidence. There are individual differences in ability to acquire the necessary information and in ability to write accurately or rapidly.

Individual differences must be considered if the students are to make progress in their learning. In technique development, individual differences may be met by: (1) demonstrating, (2) having individual conferences, (3) providing constant supervision, (4) stimulating a desire for good technique, and (5) adjusting physical deficiencies to methods of operation. Individual differences in assignment work may be met by: (1) allowing enough time for slow students and permitting additional copies for the rest, (2) giving supplementary practice for the better students while the poorer complete their work, (3) giving a limited time for an assignment and calling in papers, whether they are finished or not, (4) providing corrective practice followed by skill practice after the assignment has been completed, and (5) following the level assignment plan, using two, three, or four levels.

Supervision. The principle of supervision is now generally considered the basis of instruction methods in typing. It was not used at first, but years of unsupervised instruction proved its failure to train efficient typists. Research studies have also shown that the average achievement in a typing class in which part-time supervision is used is so far below the achievement in a class in which full-time supervision is provided that the first represents a waste of both student and school time. Some schools feel compelled to use the unsupervised-instruction method, although they know its evils, because of a lack of funds for a larger teaching staff. Some ease the problem by using supervised instruction for the beginners and part-time supervision for advanced classes.

Unsupervised work really puts the learning up to the student—a problem he cannot solve. Drill work is undirected, test work is minimized, assignments are mechanically done and so fail to impress the student with the real meaning of the forms studied. The teacher's chief contact with his students' work is through the papers handed in. A teacher who is forced to teach through glass may give written work or reading assignments to the bookkeeping or shorthand class while he goes into the typing room to conduct drills, give tests or explain form work. This is a fair division of teacher time.

Since skill in operating the typewriter depends so much on the technique developed, closer supervision is required than in most subjects. Each student presents a different problem and so requires the study of the teacher. Supervision gives this opportunity. It also affords an opportunity for the teacher's personality to function, which is most important. Some misinterpret the idea of supervision. It is not "guard duty," but rather it is a consciousness of what the students are doing, the making of oneself available for help, if needed. The student should never feel that he is being watched. There should be a minimum of interference with the student's work. The teacher's first concern should be his students and their needs. When they are not demanding his time, some paper-checking can be done, but it must always be with the attention divided, giving more to the class than to the work.

The teacher's attitude should not be faultfinding. Criticism must be given, but it should be constructive and given in a sympathetic, tactful way. Faultfinding is not criticism. Even though the student may not be doing his work correctly, there is always something that can be commended, and that commendation may soften the criticism.

Class Procedure Several methods of class procedure have been used for supervised instruction. In general, these consist of periods for drill, individual practice, testing, assignment instruction, and laboratory work. Some definite plan must be adopted if the teaching is to be successful. Some textbooks will lend themselves to the adoption of the teacher's chosen plan, while others set up a definite plan of their own. A good teacher will choose the plan of class procedure that best suits his methods of teaching and serve him best in attaining his objectives. A good teaching plan will use a time schedule, or else too much time will be given to some things and not enough to others. Even the student must work on a time schedule to complete his assignments on time. The teacher should help him make wise use of his time and be economical with his materials.

Motivation Since typing requires constant effort to develop proficiency, motivation is the key to its successful teaching. There are various methods of motivation that have been used by teachers for years, such as, grades, awards, honor rolls, penalties, ridicule, and reports to principals or parents. None of these seem to have proved really effective. Games and novelties are also used, but these are effective for only a short time. Nothing motivates as much as the desire to learn. The teacher with the skill to create that desire and to keep it alive has solved the problem.

Need for retrenchment in business brought an end to awards offered by typewriter companies for many years. While these awards made a notable contribution, a very limited number of students were being affected by them. They appealed to those who habitually won, they aroused fear in some students, and they left the others unconcerned, except as spectators. Typing contests have been depended upon for creating interest. Since they stress teamwork as well as individual ability, some prefer them to the awards. The greatest weakness of this method of motivation is that it appeals mainly to those who are naturally gifted with nervous systems that respond to an effort to increase speed, it does not appeal to the entire class.

But the contests and locally sponsored award plans cannot be relied upon to keep an entire group interested all year. The problem then becomes one of devising ways and means that can be used regularly. The problem can usually be solved by conducting contests in the class, by giving stars or other awards, by listing names on the blackboard or in the school or city papers or by posting a picture of the class group on the bulletin board. In all these methods, the emphasis is usually on speed and on some sort of competition among the members of the class. These plans always affect but a few in a desirable manner and leave a very undesirable effect on those less gifted in skill or with less desire to progress. The literature of business education will provide plenty of such schemes and suggestions but books of the secondary field of education give no hint that such things are considered pedagogically sound. In fact, definite statements are made that they are injurious to the average child's nervous system that they set up the wrong social ideals, and that they should be eliminated from any progressive educational program. The teacher who finds it necessary to resort to these external unnatural and undesirable incentives thereby admits a helplessness in keeping up interest in the subject for its own sake and for the progress made in it.

Devices for Teaching Typewriting Much emphasis has been placed on devices for teaching typewriting, perhaps because many teachers are not sufficiently equipped from the point of view of mastery of typing as a skill. This has resulted in encouraging teachers to gather together an indiscriminate collection of teaching devices—tricks of the trade—and too often the competency of these devices is judged by the variety of the teaching devices, rather than by the efficiency of their use.

Harold H. Smith defines a teaching device as "any vehicle by and through which the teacher attacks the learning problem." There are mechanical devices, like the phonograph to acquire metronomic rhythm, and blanked keys to encourage touch operation. There are visual aid devices, like charts and graphs, exhibits of student work, blackboard diagrams, and movies. There are physical devices, like finger gymnastics, or drills for finding and controlling home position. There are vocal devices, like counting keystrokes aloud, spelling, or dictating. There are mental devices, like concentrating on the copy, or attitude of success. Lastly, there are pedagogical devices, like an organized practice routine, or specially constructed drills for corrective purposes.

Teaching devices have been developed for every phase of teaching activity—for motivation, presentation, demonstration, application, drill, and testing. They may be distinguished from learning devices by determining whether they are used by the teacher or by the student. To be effective and efficient, any teaching device should aid in originating, improving, or fixing some necessary step in the student's learning process.

Teaching devices function by facilitating the learning process itself, by preventing and eliminating tendencies to incorrect learning, and by controlling favorably the physiological and psychological circumstances and conditions under which students learn. These devices assume many forms, from the crudest exercises assigned purely as "busy work," to the masterly use of mechanical aids, oral commands, systematized timed practice, daily individual and class records and graphs. Any attempt to plan or execute definite teaching activities must result in the use of one or more specific teaching devices. Thus, the teaching device is the concrete manifestation of the teaching process.

A good teaching device will not only be pointed directly toward a desirable objective, but it will also not be used after that objective has been attained. These devices are vital for student motivation, but

many of them should occupy a diminishing proportion of time as the course proceeds. Many devices are needed only in the presentation and application steps of teaching and should be dropped as soon as the student has conquered the particular practice procedure they were intended to expedite. Teaching devices used mainly for testing performance can often be discarded with the mastery of the steps they test.

If the teacher will keep the specific objective of a device uppermost in mind, he will easily detect when and how students are ready to refine their performance. Inefficient teaching devices will waste time, they will teach innumerable operations that must later be discarded or inhibited, and they will soon undermine the students' interest, hence their motivation. An understanding of why a given procedure is best must be developed in students. The theory of teaching a drill subject, like typing, is: *Show the student how to do it, see that he practices enough to master the activity, and give him the necessary guidance.* Whatever teaching devices will fit into this procedure should be chosen and used by the teacher.

Problem Solving. As in other subjects, the typing student should be taught to think for himself to prepare him for office work. Work in problem solving eliminates the meaningless copying of exercises, and thus promotes better learning. It gives the student an opportunity to use his originality and artistic ability and to cultivate good judgment. This should not be interpreted to mean that the guidance and help of the teacher should be greatly minimized. It means that the student should be directed in his thinking.

Problem solving should be used sparingly at first while so much thinking is needed for locating the keys. This is really problem solving in itself; hence, any solution as to organization of the material that the student is typing may interfere with the typing process. Thus, the teacher's instructions during this early period should be clear and more detailed than later. When the writing process becomes easier, the problem solving of the form work may gradually increase. The business-letter work affords an excellent opportunity for problem solving when the letters assigned appear in the text in a single paragraph and must be arranged in proper form, as well as paragraphed, punctuated, and capitalized. Rough-draft work, tabulated matter, and many of the manuscript forms give excellent practice in problem solving. Model forms in the textbook should be used only for study and explanation, so that unarranged material may be set up in the same or a similar form.

The *level assignment plan* involves laying out a rather definite piece of work, divided into two, three, or four assignments. The students are 'contracted' to do a given piece of work rather than to "master" a new problem. Therefore, it is also called the *contract method*. The doing seems to be the spirit rather than the objective of learning, because it is assumed that the doing will automatically result in learning. It may include problem solving, but too often this feature is not included.

The contract idea can be easily applied in typing, but its use is not recommended during the keyboard learning period. The technique of teaching the contract method consists of definitely outlining an assignment or contract of work to be done. The students choose, with the guidance of the teacher, the level they think they can complete. The preparation of the assignment or contract is scored on different levels, usually three—A, B, and C. There may also be just two levels, A and B, or four levels, A, B, C, and D. Individual instruction usually prevails. Where advanced typing must be taught unsupervised, the level plan may be used to advantage. It is also useful when it is necessary to cover ground rapidly, for on the C level the essentials can be taught while on the B and A levels a proportionate amount of extra practice on less essential matter may be covered. After a "forced" class vacation because of an epidemic, or when there is a wide range in the abilities of a class, this idea is very useful, but it is not recommended as a "steady diet." A substitute for this plan is the minimum and maximum assignment in which extra credit is given if the maximum assignment is completed.

Clear instructions should be given with each contract, but they should never be so detailed that all opportunity for originality, or initiative, is lost. A contract should cover a definite period of time, usually a week. Interest in the work will not hold for a much longer time.

In grading work under the contract method, the level of the contract completed becomes the level, or basis, of the grade. Thus it would be impossible for a student doing only the B level contract to get a grade higher than a B. The B would be the basis for the grade, and from it would be deducted the amount necessary for errors of any kind.

There are other special methods that the teaching profession employs that can be adapted to instruction in typing. While some of them apply better than others, all are sufficiently adaptable to be used, if the teacher desires.

The Teaching of Large Classes Successful teaching in a large class requires the use of special techniques that are not needed in smaller groups. Although about thirty students is the most that can be taught

effectively, the tendency in large city schools is to assign many more to beginning typing classes. This creates a greater problem for beginning work, where supervision is more essential than for an advanced class. Should these classes consist of selected students grouped in classes according to their abilities, then the problem is somewhat simplified, but usually this is not the case. Motivation devices that work in small or average-sized classes will bog down in these large classes, for these devices are unwieldy and also involve extra clerical work in keeping the records.

In a large class, the teacher must make an effort to know the students by name and will find it practically impossible to study their temperaments, faults, techniques, or difficulties. The class periods are just mass practice, tests, and budget work. Individual attention is impossible. Some progress may be made, but improvement is more or less accidental or the result of the students' own efforts.

There are a few devices that will help the teacher in this situation. One device is to group the students within the class after the first test, according to their ability. Then the better students can be placed in one section of the room, and the poorer, in another, as the teacher observes and checks their techniques, the process of grouping may continue. Little need be said about this grouping plan to the students, but it will be an aid to the teacher to know just where he should spend his coaching efforts for the day. Of course, not all the time should be spent with any one group. To work individually with each student each day is impossible, so a systematic plan will permit some time to be spent with each student each week.

A seating plan will be helpful if it has on it not only the location of each student but also as much of his typing case history as is desirable. The seating chart may be made of heavy cardboard, covered with cloth and with pockets for the cards. It resembles the device used by many principals in making teachers' programs. The chief advantage of the pockets is that the card may be changed about as the student changes room location. The card should carry the student's name, home room number, his record on important tests, his highest rates, and any notes the teacher may wish to make regarding his work habits, error tendencies, etc.

Still another device is the check card for the student's typing technique. These may be made out by the student and rechecked by the teacher, and after that, the teacher can check him weekly on any items that need attention, giving him an opportunity to see the card to follow

his improvement. Should the teacher not have time to check these each week, student monitors may do the work if the teacher will check up on them at intervals. Thus, the students become technique conscious and should strive to improve by proper concentration of effort and practice.

The above devices do not have to be used separately and are flexible enough to be applied to any situation. Since they are not the only devices that may be used, they should suggest even better plans to the teacher with enough originality and initiative to develop his own.

CLASS DISCUSSION QUESTIONS

- 1 Distinguish between an old type and a new type teacher of typing.
- 2 What else is necessary to train a good typist other than a typewriter, a textbook, and a teacher?
- 3 Is it possible to train a good typist with a poor textbook but a good teacher? If so, what makes it possible?
- 4 Which one of the eight essential points for the best learning order do you consider of major importance in typewriting instruction? Which one should rank second?
- 5 Discuss the five principles of habit formation given in this chapter.
- 6 How would you explain to a typewriting class the true meaning and application of the word *concentration*?
- 7 Discuss the importance of interest when learning typewriting as it concerns the student and also as it concerns the teacher.
- 8 If students are interested, will they be attentive? Can a teacher get results with forced student attention?
- 9 Discuss the eight pedagogical principles of typing instruction.
- 10 What is the chief purpose of drill in typewriting? What makes the drill period of each class hour successful?
- 11 Explain the statement: "Giving an intelligent assignment is a teacher's opportunity to teach."
- 12 Can you suggest ways other than the fifteen given in the chapter that individual differences apply to typewriting?
- 13 Is a good teacher dependent on devices for motivation?
- 14 What is a teaching device? How do teaching devices function? What forms may they assume? Give an example of each of the six kinds used in typewriting.
- 15 What is the real value of problem solving in typewriting work?
- 16 What is meant by the "physiological limit of improvement in learning typewriting"? What is meant by the "psychological limit of improvement"?
- 17 What psychological factors influence the rate and amount of improvement that learners of typewriting make?
- 18 What environmental factors affect the rate, character, and limitations of improvement in typewriting?

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CHAPTER VII

The Importance of Basic Skill

What Is Skill? The dictionary says that skill is familiar knowledge, united with dexterity in performance. The psychologist says that skill is an end product, an outcome of some form of systematic, organized activity and comes as a result of effective organization. In acquiring skill there must be a twofold purpose namely (1) each learner must have some objective that will represent his progress and development, and (2) each learner must through his own efforts and his own introspection, feelings, and emotions, be able to explain to his own satisfaction the factors that determine his growth and development in acquiring his skills.

It is necessary, first to ascertain the habits involved in mastering any particular motor performance as well as what precedes the formation of habit, that is, the retentiveness of the nervous system the formation of associations and the development of memories. It is also necessary to find how associations are formed and developed in the course of the acquisition of a skill as well as in the acquisition of knowledge. This information should make it possible to understand what takes place in the organization of the individual when he reacts in a definite way when the same stimulus is presented to the same sensory end organ.

The formation of habits that result in skills requires a nervous system exceedingly plastic and susceptible to impression. Because of this tendency to adaptation it is possible to condition responses to individual needs and to the acquisition of specific skills. The neurones are the elements of the nervous system that are used in habit formation. In

order to form neural patterns, the nervous system must be plastic, impressionable, modifiable, and retentive. In the formation of neural patterns, the reflex arcs must be used. The innumerable neurones of the nervous system make reflex arcs possible. Changes in these arcs will change the composition of the sensory and motor impulses, and thus a new neural pattern or motor pathway of discharge comes into existence. The acquisition of skill presupposes a conditioned reflex of a highly specialized and developed nature.

The habits that furnish the basis of acquired skill have to be formed, and the first essential is to have a nervous system that will be susceptible to change, and this change must remain. The nervous system must have the power of retention and then, before the skill becomes effective, there must be a recognition and an interpretation of these reactions. It would be impossible to increase our skills and efficiency in motor or mental performances if the nervous structure were not susceptible to a stimulus and capable of being modified. The way one thinks is just as much a matter of habit as the way one acts, and the brilliant student is the one who is skilled in organizing and reorganizing the content of his past experiences. An intellectual and emotional element enters into the building of every habit and the attainment of every skill. The desire to improve, the annoyance attending wrong practice, all aid in the formation of a habit.

What Is Typing Skill? Typewriting is a collection of skills. Every thought and every act of the typing student constitutes learning that consists of acquiring some kind and some degree of skill in the operation of the typewriter. The resultant problems are the same as those that arise when pen or pencil are used for idea recording.

Developing basic typing skill involves giving the student the foundational knowledge and uniting it with dexterity in rate, accuracy, and smoothness of performance. Some choose to separate "knowledge learning" from "skill learning." Thus, before the student attempts correct performance at the machine, he is acquainted with the facts needed in understanding this particular performance. Others offset this separation by stressing technique first. The separation plan involves much explanation by the teacher, while the technique plan requires less teacher explanation but more demonstration. This latter plan is the one recommended.

Skill in typing has three characteristics that are really common to all skills. These are (1) the rate of performance, called speed, (2) the correctness of performance, called accuracy, and (3) the smoothness of

performance, called rhythm, but better named fluency. These three are qualities of the technique learned as well as of the result obtained. While the student may be mainly conscious of the resultant skill, his teacher must be mainly interested in the skillful action that produces that result, and must always seek to improve both action and result. Skills come as a result of the integration of activities through the organization of habits. Motor skills like typing are acquired through the motor responses or activities. While a skill is in process of formation it must be given an opportunity to grow and develop unhampered if the best results are to be obtained.

Typing skill is worth comparatively little unless with it right attitudes toward its development are formed. Little if any learning takes place when the learner does not want to learn, does not think he can learn, or discovers that the teacher has decided he cannot learn. Typing skill cannot be bestowed upon him; it must be achieved, and he must be willing to assume responsibility for this achievement. This attitude broadens the scope of the teacher's work by requiring a better understanding of skill development as well as the attitudes necessary for its formation. The student should learn early that the success of his effort will depend to a large extent upon the attitudes he has toward his work. A good attitude will be demonstrated by the sincerity of his effort and the value of his product. High standards encourage the best efforts of the student while low standards coddle him into a satisfaction with results below those of which he is capable. The teacher must know the approximate rate of progress that should be maintained and use the teaching procedure that will maintain that progress.

The Skill Learning Problem How to acquire skill is the first learning problem; how to apply it is the second. Skill learning is one of the simplest types of learning for a skill is gained largely through the right kind of practice. One learns to type by the *right* kind of practice, not merely by *any* kind of practice. Right practice cannot be standardized because it will vary with different individuals. Therefore there is no one best method nor one best practice procedure except as applied to a certain individual.

The maxim "Practice makes perfect" was long recognized, but now it is believed that mere practice of any kind will not bring the desired acquisition of a skill. Hence the maxim has been modified to read "Practice makes perfect when intelligently directed." Educational psychology has given evidence that practice makes perfect only when certain conditions exist. These are given by Frances R. Botsford in an

article, "Practice Makes Perfect," in the *Business Education World*, March, 1934.

When Do Skills Develop Best? Skills develop best under practice conditions rather than on application work. During the skill-development stage of learning, the more nearly practice conditions approximate practical working conditions, the slower and less effective will be the development of the skill. At this stage the process of typing is always more important than the material typed. If the learner's skill is to develop rapidly and effectively, he must be allowed to experiment, to take chances, although it may often result in errors in the copy. At the beginning, however, it is much better that the wrong key be hit the right way than that the right key be hit the wrong way. If he is doing assignment work, he cannot afford to make errors, and therefore he will be forced into incorrect processes in order to be sure of correct results.

Therefore, error emphasis should be minimized in the early part of the typing course. A premature attempt at too accurate control will sometimes give accuracy, but it will inevitably result in seriously lowered speed and in permanent impairment of technique. If the learner will first gain speed, it should be relatively easy to control that speed later. If he gets only accuracy, it is extremely difficult to speed up his writing later. The important thing is that the practicing be done under practice conditions; that is, the student should practice and experiment without too strict an accountability for the typewritten results. He is learning new motor controls, and these must not be impeded by an insistence on accurate copy.

A skill should never be forced or strained until it has been well established because, when one attempts to change from practice conditions to practical working conditions too early in the development of the skill, the skill will be forced or strained prematurely. At first the skill should be developed tentatively. Too early an attempt to combine the "raw" skills of shorthand and typing into the finished work product of transcription is also to be avoided, as it very largely destroys the practice conditions and tends to set up too close an approximation of actual working conditions. When transcription does finally begin, it is not wise to try for mailable transcripts at first. The student should be given some opportunity to experiment to determine *how* the thing is best done before being responsible for accurate transcripts.

The earlier the stage of the skill learning, the more imperative it is that the practice be done under practice conditions. A part of the time should be set aside every week for the improvement of technique and

the increase of speed without responsibility for results on paper. Such practice should consist of more than just timed writing. The teacher should test his teaching procedures from day to day to be sure that each drill given, each assignment made, will provide as wide a range of practice as possible. Too high a degree of refinement too early in the learning process should not be attempted, for students learn most efficiently when the entire organism learns the entire skill act.

Consciousness of the mechanical details of a skill impairs and sometimes completely inhibits its performance, and so any attempt at conscious direction of the skill will influence the skill act. It is extremely difficult to find language to get ideas across effectively to the learner. When the attempt is made, often the learner fails to comprehend the attempt and goes on learning in his own way.

An illustration is the controversy over the key stroke in typing that has continued for years. Teachers glibly describe the key stroke—but with no general agreement. Even expert typists have little idea of exactly how they are stroking the keys, and the slow motion camera reveals that their attempted explanations are sometimes wrong. Because there is no language of the motor skills, these attempts to describe the key stroke have been clumsy. When the student has tried to comply with what he could understand of a description, he has almost never derived much benefit.

A knowledge of the mechanical details of the skill acts involved in typing is almost indispensable to the teacher. That knowledge, however, need not be passed on by the teacher to the student. It should be used by the teacher as a means of diagnosing the exact difficulty from which a student may be suffering, and as a basis for prescribing remedial drills that will cure the difficulty. Undoubtedly, one reason why many teachers find so much trouble in attaining personal skill in both shorthand and typewriting is that they know too much about the mechanics of the skill. The teacher with initiative may use many devices to develop in the student the performance desired without succumbing to the temptation to describe or explain motor skills.

Relaxation Important. Skills are best learned under the most favorable conditions. Anything that makes the learner's path smoother and easier will hasten the acquisition of the desired skill. Perhaps the most important of these favorable conditions is relaxation. This word needs some clarification. Relaxation does not mean limpness, if one is completely limp mentally and physically, he can accomplish nothing. Relaxation involves complete relaxation of mind and muscle except

for that part of the mind and those muscles actually needed for the task at hand. Many symptoms of the lack of relaxation may be observed in the typing class, ranging from the protrusion of the tongue to fidgeting in the chair. Relaxation insures the accomplishment of the most work with the least mental, physical, and nervous effort. It is gained when one knows exactly what the task will be and exactly how much effort will be required to accomplish it. It is lost when one does not know just what will be demanded of him, when one is not sure how much effort will be required, and when one has reason to suppose that he may not be able to accomplish the required task. In order to make it possible for students to maintain that state of relaxation that will enable them to give the best skill performance and to make the greatest advance in skill developments, teachers must be sure their students know exactly what their task will be and how much effort will be required. When the teacher applies pressure for greater speed and accuracy, students become tense. If more speed and accuracy are wanted, a situation that will result in these must be set up. By asking for what the students do not know how to give, the confidence and understanding that will alone give relaxation are destroyed. Nothing will more certainly prevent any hope of relaxation than the demand for a higher degree of control than should be required at any given stage of the learner's progress. Thus, the demand for too high a degree of accuracy hampers the formation of correct techniques both by the creation of tension and also because the learner is forced to use a slower stroking rate to avoid making errors.

Experts in every skill relax at every opportunity because they have learned from experience that their reserves of control and of energy can be best built up in this way. Expert typists not only relax their fingers by returning them occasionally to the home keys, but they relax the entire hand and arm at every possible opportunity. The chance for complete relaxation of this kind frequently occurs for one hand while the other is returning the carriage or turning the pages of the copy, or for both hands during a temporary cessation of typing.

To help students master relaxation as soon as possible, the teacher should frequently allow a short pause for relaxation. This gives tense students time to loosen their muscles and really relax. This may be unnecessary with bright students, but even the most apt learners will profit from some instruction and drill on this phase of skill. To insure the proper degree of relaxation, instruct students to drum lightly with the fingers on the home keys without depressing them, allowing the

wrists to rest on the front frame of the typewriter. Students can learn to relax if they will do this whenever there is a brief pause in their typing. The dictum against permitting wrists to rest on the typewriter frame is justified if the student is trying to type at the same time.

Most learners will not relax as often as they should; so typing students need constant reminders to relax or to pause. Ardor and ambition cause them to sustain their practice efforts until tension mounts too high, with loss of control as the consequence. The teacher should be on the alert for evidence of excessive tension, so as to guide the student's efforts until he learns when and how to relax. It is hopeless to try to attain these ends through the lecture method or by mere suggestions. Telling a student to relax does not help, because he may not know how to relax. The teacher can create a situation in which tension mounts rapidly to the point of fatigue. Tension can be induced by requiring drill on any motion or on several motions at high speeds for short intervals. When the need for relaxation thus becomes evident, the teacher should demonstrate to the student how to relax properly and to the best advantage. Beyond this, the teacher can occasionally call a momentary pause in any operation or can set up drills embodying pauses at definite intervals. During these rest periods, he can determine whether students relax habitually and promptly by observing the position of their fingers and wrists.

The Relation of Repetition to Skill. Skills are not learned best through repetition, as was once believed, but through re-creation. What is the difference? It is repetition when the learner merely types a given word ten consecutive times; it is re-creation when the learner types the given word ten times, each writing occurring in a different context. It is necessary to re-create the mental concept each time. The learner *performs* ten times instead of merely repeating one performance ten times. He habituates himself to the re-creation and performance of the writing pattern in differing conditions, which is a very different matter from repeating the pattern in isolation. The performance, in isolation, of the various parts of a skill act is the least efficient way to learn it. It should be learned and practiced in units as large as the nature of the skill permits. Parts of the skill practiced in isolation often fail to function when attempting to combine them. Modern typing textbooks give relatively little isolated-word practice of any kind; much of the practice material is given with the sentence as the smallest unit. Paragraphs provide more effective practice than sentences, and the sentence is better than a line of isolated words.

A teacher can show the learner what procedures to use and suggest how he can best direct his efforts; but he cannot learn for him, nor force him to use a good method—it is up to the student. Compare the expert with the novice. One gets much better results than the other, makes fewer mistakes, produces better looking copy, and takes less time for it; but watch the two at work. The novice makes jerky, erratic, needlessly clumsy movements; while the expert works smoothly, evenly, with economical motions. The novice is obviously under strain, while the expert works easily and with relaxation. The expert uses his sight and muscle sense differently from the novice. These are the factors on which to concentrate, for they are the causes of superior performance. They indicate the kind of changes the learner must make in himself, if he wishes to build up skill. In good learning, one must concentrate first upon the pattern of action or behavior rather than upon the results. Speed and accuracy are desirable; but they are secondary when one is learning, for their cause is primary.

The task of the learner is to create in himself the action patterns of the expert—to transform his movement pattern from the clumsiness of the novice to the economy, ease, and smoothness of the expert. He will not do it just by blind, unthinking, unguided repetition. He will do it by thinking, by analyzing, by using his intelligence. Ten repetitions, each of which is a separate experiment in which he tries to control his whole body, to relax, and to work smoothly and economically, will do more for the learner than a hundred repetitions that are just repetitions. The scientific evidence of this is clear. Experiments have shown that when a set of movements is repeated in a purely routine manner, without any thought or analysis, there is little or no improvement—for one doesn't improve one's walking just by doing it over and over again. Results are better as long as one tries to improve, as long as one works intelligently for greater efficiency, and no longer. Caring, trying, analyzing, concentrating, criticizing, attending—all these are necessary if one wants to learn well and swiftly. Intelligent study and direction of movement patterns, not mere repetition, are the key to success.

The Function of the Teacher in Skill Development. There are always two sides to a teaching situation; both are equally important if one wants results. A learner needs to be able to make use of his teacher properly, and a teacher needs to know how to present his services so they will be of the greatest use possible. Correcting errors in stacks of papers is a dreary job that consumes a great deal of time; also, much of this work is useless because it is often routine rather than intel-

THE IMPORTANCE OF BASIC SKILL

ligent. The dividends in actual improvement achieved by the learners seem to bear no relationship to the teacher's output of time and energy. When a paper is returned with a good many errors checked, attention is called simply to the number of errors. This is not enough, for it is what is done about it that matters. Simply telling the student that he has made an error is a pretty meager kind of help. Sometimes the teacher must catch and indicate every error made, as in tests. But the test is not only for the sake of measuring and marking, it can do some teaching.

It is quite true that the errors corrected ought to show the learner how to learn better, how to set himself more accurately, how to go about his job more intelligently, but it is not true that mere straight drill on just these items and nothing else is the correct thing. Always remember that an error is a symptom—a sign that one is not using one's hands, or ears, or eyes properly. It is the underlying cause that should be tackled. Perhaps practice on the incorrect word itself may not be the right prescription at all. The word may be wrong because of the context in which it appears, or because of some basic fault of adjustment. A mistake should be an incentive to thought, analysis, and experimentation, not merely to blind drill and repetition. Routine correction of mistakes is deadly work for the teacher and offers little interest for the student. The teacher who uses his mind, as well as his pencil, on such problems will enjoy his job much more, and he will get his students to use their minds, and to combine interest with success.

The task of the teacher is to save the learner from the stupid blunders of approach and method into which anyone may fall without outside aid and criticism. The teacher is there to help make the attack on the learning problem intelligent. The teacher's part in the understanding is to do his best to save the student from blunders, to save him from wrong methods of attack, to save him from not recognizing his own mistakes and their cause.

Typing Skill Should Become Typing Power The aim of typing instruction is the development of typing skill, which should eventually become typing power. Typing power is the result of the development of precise habits of machine control and the understanding of related knowledge that makes for the effective use of typing skill. Neither speed nor accuracy, nor their combination gives typing power. Typing 80 words a minute may be skill, but, if such skill cannot be used effectively in the typing of a large variety of office and personal work, then the typist does not possess typing power. Typing power is high

skill plus related knowledge or understanding that permits effective use of the skill.

Typing power rarely increases stroke by stroke. All psychological findings indicate that the learning process should be regarded as a prolonged rhythm of consolidation and application, with both elements alternating and interweaving with each other, and neither at any time being entirely out of the picture. One of the most challenging and essential responsibilities for any teacher is to set up and wisely guide this continuing rhythm of consolidation and application. When the idea is put into operation in teaching typing, progress becomes rapid, and advance continues to indefinite limits.

Consider the psychology of the student who begins the learning of the keyboard. He is facing something new, strange, and different. He is to orient himself to the "geography" of the typewriter. This is a very simple phase of application. Soon his whole psychology changes. What began as novelty and challenge now passes over into a phase of consolidation. His preliminary adjustment has established itself, at least tentatively. The question is: How long should he remain at this stage until another novelty is introduced? The answer is that he should stay there until the basic orientation has established itself reasonably well. One good criterion is that he should continue the consolidation phase until he no longer needs to think or worry or hunt—until the adjustment seems to have become automatic. It will be a great mistake to hurry him on unduly fast to new difficulties and problems. Many of the most serious hindrances to progress come from doing this very thing. Furthermore, it has been proved experimentally that a basic automatic adjustment of this kind is best established by plenty of easy practice. The routine should come to a sturdy growth before he tries to do anything else. It will be a serious mistake also to hold the learner too long on the level of sheer consolidation or drill. It is impossible to tell in advance how long this will be. Not enough is known about the intimate details of the learning process to be able to make such a statement. But it is quite likely that progress is too individual a matter and influenced by too many subtle factors to be predicted in any such precise fashion. The teacher must use his own judgment. When any phase of consolidation seems quite well established, then introduce a new problem, try a new application, and see what happens. If there is a breakdown, go back to the consolidation phase again.

Exactly the same psychological principle of consolidation and application applies to the proper use of typing exercises or assignments.

The first exercise a student does is, for him, a novel and challenging application, although it is made deliberately simple by omitting many of the factors that must be considered in producing good copy. But very soon he passes into another psychological phase, that of consolidation or drill. This should go on until the adjustment is established on a working basis. Here again, the best indications are the student's confidence and ability to carry on without worry or concern. Later, when the time is ripe, he faces new and still more complex problems—like those involved in turning out good straight or form copy. Now for a longer time, these problems are in the general class of applications. He is using his previously acquired capacities in new situations, but after a time the higher level becomes consolidated also.

Learning a skill may be likened to putting together a piece of machinery, not from blueprints, but by trial and error. The learner begins with a vague notion of what he wants but none of the parts fit, and the mechanism won't work. He vaguely envisages the mechanism called typing power, but he has none of it. If he started to work on the mechanism all over, he would be in a constant state of confusion and would probably get nowhere. Therefore he does one part first and then another. As each part comes into adjustment he can fit others to it, perhaps making some backward corrections as he proceeds. Even the expert may sometimes benefit from taking the whole mechanism of his skill to pieces and polishing up and refining the separate parts. In other words, consolidation or drill even on an elementary level is not wholly and solely a matter for the beginner. It is necessary for him to take one thing at a time and get it into working order. But advance at the highest levels may often involve small corrections of the simplest and most basic adjustments.

Those who believe in pure incidental learning and the use of nothing but applications have only part of the truth. Learners do advance by a series of dramatic challenges but learners cannot ignore all intermediate stages and reach the goal in a single pulse of effort. Those who believe in pure drill also have only part of the truth. Adjustments must be given time to establish themselves. Where they are wrong is in thinking that if learners do nothing but plod along with a certain type of situation whose novelty and challenge have long since departed they are serving the learner well. Learning is a rhythm of advance and pause, of application and consolidation, and must be so treated if the best results are to be obtained. Likewise typing skill becomes typing power by the same procedure.

Routine Necessary for Skill Development. Educators have long been interested in discovering the best possible routines for all types of learning. By 1910, after extensive experimentation, the typists who were trained in the speed training schools of the typewriter companies settled upon a standardized routine that has since been followed by those who have attained the greatest expertness in typewriting.

Skills can be acquired only through intelligent and continued practice. Better results can be obtained if the practice occurs at regular intervals and follows a definite, well organized routine. The effectiveness of the routine in a large measure determines the quality of the acquired skills. Essentially, there is one basic routine for the practice period. It is modified (1) to permit the introduction of new types of learning, (2) to expedite the acquisition of various basic skills, and (3) to aid in the application of basic typing skill to production work. In every well rounded practice period for developing any skill, the learner should divide his efforts into the following steps: (1) a warm up to recall previously acquired skills, (2) intensive drill that aims to improve one thing at a time, and (3) practice to consolidate these improvements and to make time an integral part of the student's composite skill. In connection with each step must appear the following: (1) the will to learn, to improve, which implies some sort of checking or measurement of what is being done, (2) definite diagnosis of difficulties, and (3) the carrying out of suitable remedial or corrective work. Although most beginning students are interested in acquiring skill, their interest is general, and they only vaguely grasp the importance of the will to learn, diagnosis, and skill improvement practice. It is the teacher's part to make the importance of these elements clear and thus enable him to use them.

The teacher must be careful not to confuse system with routine. A lesson plan may be highly systematized, yet it may lack the vital essentials of adequate warm up, improvement, and consolidation practice and so fail to qualify as a worthwhile routine. The great advantage of uniform routine, aside from its contribution to a steady, rapid development of skill, is that the student quickly becomes adjusted to it. The regular, recurring steps of the routine reflect themselves in a regular recurrence of attitudes, of thought, of expectation, of exertion, of intelligent effort, of the will to accomplish. This sequence engenders precision, certainty, confidence, self reliance, and drive. It encourages the growth of fast, accurate, and fluent responses of mind, eyes, and hands. It deprives the student of all reason for sitting idly while he

wants to be told what to do next By stimulating his memory of and his associations with similar steps previously taken it breeds intellectual curiosity in his progress and arouses the desire to improve A self-generated desire to improve is a prime requisite for learning particularly for skill learning

Routine must never be reduced to a mere assignment basis A teacher who systematizes his work without reference to the way skill is acquired naturally is attempting to teach forcibly learners who have no desire to learn Their interest fades as soon as the pattern of his routine unfolds They practice listlessly, for the routine is monotonous

The student should be reminded that every step in every lesson of a good typewriting text is associated with one or more definite aims, which are often stated in the instructions that accompany each exercise in the early lessons and are linked with the various steps of the practice routine as it is developed In the later lessons, occasional references may remind the students what should be the aim of each effort they make The teacher must be responsible for vitalizing these aims and making them as vivid as possible Yet this does not prevent the teacher from exercising his own judgment in making minor changes in the routine The teacher must always adapt the routine to meet the needs of the students When their difficulties have been overcome the regular routine may be resumed Such variations in routine will usually consist of the substitution of one aim or one kind of practice, for another Often the variations will consist merely of a change of aim the student typing the same material for the same length of time as his classmates Sometimes it will consist of a radically different kind of effort on different matter, perhaps to overcome discouragement However, it is best to make as few departures as possible from the routine and lesson plans of a text especially when the teacher is inexperienced Many teachers do not realize the full value of their text because they do not give the text a chance to show its worth

In selecting a suitable routine the teacher must be guided by an adequate background of knowledge and experience The choice depends entirely upon what is to be learned and how it can best be learned The instructions in a textbook are usually cast in terms that the average student can understand Poorer students will need advice and proper supervision Yet the basic nature of the routines should not differ Regardless of individual differences, some steps in the routine will take more time because of the necessity for more thorough and repeated explanations, but every step, including the final drill in appli-

cation, must be taken, or the learning process will be incomplete. Beyond that, everything a typist does calls for skill, and the highest possible degree of skill can be acquired only through the skill routine.

The Importance of the Method Used. At its best, a method is just a device and cannot take the place of good teaching. If typing is actually taught and students are not just assigned textbook exercises to do, the method used is probably of less importance than other factors in getting results. The important things for teachers to consider are the choice of teaching materials, the wise use of teaching techniques, and the timely motivation of student practice. The typing teacher must demonstrate, teach, criticize, encourage, direct, challenge, and train by constantly improving his methods.

Methods for teaching typing vary in details more than they do in outcome. Helpful procedures can be taken from each method, and these can be woven into an individual plan of teaching that may be very effective. There is danger in being limited by the rules of a particular method. In the different methods of teaching typing, however, there are rather definitely established points on which there is agreement. A study of those points of agreement can be profitable, for from them real help can be derived in deciding upon teaching procedures that will be effective in promoting better learning. Regardless of the teaching method used, all teachers of typing must (1) observe students at work in order to know how to plan for remedial practice, (2) mingle with the students on the floor so as to give individual help when needed, and (3) lead students to experiment so they will recognize the need for organized materials and teaching procedures by which typing power can be developed.

It is impossible to include in a typing text all the suggestions that the student needs for directing his mental and physical responses. This is where the teacher, with his knowledge, his skill, his experience, his understanding of the principles of learning, and his art of teaching, can contribute much to the solution of the student's problems. There must be sufficient flexibility to permit necessary adaptation to the needs of each student. The trend for many years has been toward analyzing learning procedures and selecting those that appear to be the best in broad outline for particular types of learning. So thoroughly has this trend been translated into action that one of the claims offered by most basic texts today is that they are "lesson planned." It is not the steps in a lesson nor the ground covered by each step that determines the

quantity and quality of learning. The important element is *how* each step is taken, hence the teacher must have very definite guiding principles and a comprehensive philosophy as to what the student should attempt to accomplish. The first step in all types of teaching is to establish "group control." Proper motivation toward something that the student recognizes is worth learning and the direction of his attention toward the problem must precede every step.

Some Teaching Problems The teacher must know specifically what the student should learn at each step. These may be particular mental responses or physical motions, items of information about working tools and materials, about correct form, about the way to handle typed papers intelligently, or about the way to carry on various activities connected with the typing job. The teacher must know what attitudes should prevail toward each step in the learning and toward those for whom the typist must work. Most important, however, are the elements of skill through which knowledge and attitudes assert their worth in a functional manner. Skill in the use of both knowledge and attitudes must be attained just as skill must be attained in making physical motions and the mental responses that control those motions. All skill is measured by the speed, accuracy, and fluency that characterize it.

Since typing skill must be achieved, the student is forced to assume the responsibility for his own progress. This does not lessen the importance of the work of the teacher, but broadens the scope of the teacher's task by requiring an understanding of the necessary student attitudes as well as skill development procedures. The teacher can direct, stimulate, encourage, challenge and study his students. The student must work, follow directions, believe in himself, welcome criticism, take suggestions willingly, and possess the right physical and mental make up for skill.

Teaching problems may be divided into those centering around administration and classroom management.

Administrative Problems The four major administrative problems concern

1 Classroom Equipment The problems connected with classroom equipment were discussed in Chapter III

2 Selection and Grouping of Students The selection and grouping of students is usually beyond the control of the teacher, yet many typing teachers could exercise more influence than they do in convincing administrators that typing students may profit from proper selec-

tion and homogeneous grouping as much as students in other departments. In any event, it is always wise to seat students of similar capacities together in the classroom.

3 *Supervision* The supervision of teachers and of teaching is highly important but almost nonexistent in many schools. If administrators do not exercise their responsibility in this regard, teachers may often provide a satisfactory substitute in the form of a combination of sympathetic understanding and a co-operative spirit in working out their mutual problems. Co-operation is vital between the teachers of parallel typing classes and between teachers of preceding and following typing courses. If it can be extended to the English Department, the Short hand Department, and the other divisions of the school, superior morale and results are bound to follow.

4 *Course and Lesson Planning* Course and lesson planning constitutes an administrative responsibility that, under the right conditions, can be solved in part by the classroom teacher. Most of the present-day texts are built around a definite course plan, with each unit or lesson constructed on a definite plan. Even though the plan may be well made, the teacher must adapt the lessons to the needs of the situation. While uniform achievement standards cannot be set for country wide application in all types of schools, achievement standards that are definite and adequate must be set up if confusion and low performance goals are not to result. Whatever standards are determined upon it is usually good practice to acquaint students with them. If students know that they will be expected to reach a certain goal or cover certain ground within a week or a month, and if this information is brought to their attention frequently by means of notices on the bulletin board, for example, interest and learning effort will be greatly increased. Such goals, however, should never serve as a lash held over students or used with too great pressure for high grades.

Classroom Management Problems By far the greatest number of problems are of the classroom type, for which the teacher is generally considered to be responsible. Discipline, teacher student morale and the control of light, ventilation, and temperature are strictly the teacher's responsibility. Proper conditions must be maintained for all study and practice activities. When students engage in intensive efforts to improve their speed or accuracy on any kind of work, the teacher should protect them from unnecessary distractions. The teacher is also responsible for making the best possible use of the available equipment.

He should give due consideration to individual handicaps of sight, hearing, physical deformity, and of abnormal personality. Every teacher should make a thorough study of the psychology of the emotions and of human behavior. Without an understanding of how these affect individual students, he will find it difficult, if not impossible, to carry out effectively the progressive steps in the teaching process—from establishing class control to the ultimate testing of results.

Teaching and Learning Problems Teaching and learning activities constitute the largest single segment of the teaching problem. They are universally recognized as the teacher's responsibility, yet the experienced teacher knows that the burden of the responsibility may gradually be shifted to the student as he becomes properly self-critical and capable of directing his learning activities more efficiently. Setting up and maintaining suitable standards of study and practice is the teacher's job.

CLASS DISCUSSION QUESTIONS

- 1 What is skill as the dictionary defines it and as the psychologist explains it? To what extent do the definitions agree?
- 2 The formation of habits that result in skills requires what?
- 3 What are the three characteristics of typewriting skill?
- 4 Distinguish between "knowledge learning" and "skill learning."
- 5 How does the student's attitude influence his skill development?
- 6 When do skills develop best in typewriting?
- 7 Why is relaxation so important to skill development? What are some of the best ways a typist can relax while typing?
- 8 Does repetition practice aid skill? May it be a hindrance also?
- 9 What is the teacher's responsibility in the student's skill development? How important is it that the teacher have skill?
- 10 What is the difference between typing skill and typing power?
- 11 Why is routine necessary to skill development? What three different types of routine are used in typewriting?
- 12 What four things should a good method of teaching typewriting provide?
- 13 How many administrative problems influence the teaching results?
- 14 How may classroom management affect the results obtained?
- 15 In what percentages should the teaching and learning responsibility be shared by the teacher and the student?
- 16 How should an error be regarded during the early learning stages of skill development?
- 17 Should papers be checked during the early stages of skill learning?
- 18 When should problem solving be introduced?
- 19 How may a teacher of typewriting help the student develop emotional stability?

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CHAPTER VIII

The First Instruction

The Learning Stages. The learning process in typewriting involves four stages; namely, the keyboard learning, the basic skills, the advanced skills, and the practical applications of these skills. Each of these four stages involves two kinds of learning; namely, skill learning and knowledge learning. These are distinct parts of each stage; yet they must work co-operatively. Since it is psychologically true that incorrect practice interferes with economical learning, and since also the skill learning includes all the skill-acquiring activities that are engaged in after the knowledge learning has been perfected, it would seem to be correct that the knowledge learning be perfected first.

This separation of the learning activity into these two parts, with the practice following the perfection of the knowledge learning, reacts most favorably upon the student. He approaches his initial practice with confidence, and his greater degree of success intensifies his efforts. It is probable that the failure of some students who give promise of becoming good typists on the keyboard level or even on the basic-skill level, but who fail when they reach the advanced-skill level, may be attributed to the fact that they have not perfected the knowledge learning that is involved. The teacher should have some means of determining whether each student has completed his knowledge learning before he is permitted to practice for the acquisition of skill. This may be done by the use of tests based on knowledge involved in the particular skill to be learned. But the keenly observing teacher can tell by each student's first attempts at skill whether he is applying correct or incorrect knowledge learning, and thus testing is unnecessary.

In the first, or keyboard-learning stage, the student should learn the keyboard through the building up of efficient movement patterns

for the most used letter sequences. He does this by first determining the reach for the new letter and then combining this with other learned reaches. By this procedure he may build up the motion pattern for a word of high frequency at the same time he is mastering the reach for a new letter. Every effort is made to develop mastery of the keyboard in terms of movement concepts instead of visual concepts. Although typing skill eventually becomes purely automatic it begins as a highly conscious process and anything that makes the steps in this process easier tends to give the student an early feeling of mastery. Through the teacher's explanation and demonstration and his own experimentation in teaching the learner will fix in his mind the direction and distance each finger has to reach with the result that the keys can be operated without looking at them. From this time on he works with only kinaesthetic sensations for each letter.

Learning the keyboard is almost entirely a matter of intelligent practice. Formerly, it was thought that students should "master" each new motion before another was introduced. When it was realized that "mastery" is a flexible term that even the experts are still trying to master their keyboard motions that "correct technique" cannot be divorced from a certain minimum speed of motion in action and that the primary objective is to prepare the student as quickly as possible to practice sentence and paragraph material it became apparent that a great deal of time and effort had been wasted in the keyboard learning stage.

In the second learning stage basic skill development the teacher really begins to train for skill in the sense that a coach trains athletes. This learning stage is called by some the "word phase" and by others the continuity writing stage. Some consider it a separate phase that follows the keyboard learning stage and well it may be if the keyboard is taught in only a few lessons. When four or five weeks are devoted to it then the basic skill development may be dovetailed into it and continued beyond the first stage for whatever time is necessary.

The keyboard section can be shortened and simplified and the trend is in that direction. This is done by spending less time trying for complete exercises containing fewer errors by teaching only the major operative parts of the machine by using more demonstration and less lecture work and by spending less time drilling on the numerals and special signs. No greater mistake can be made during this keyboard learning than merely to assign a certain number of perfect copies or to make other accuracy exercise requirements. The material is for

practice, not copy, purposes. The average student cannot sustain his concentration on accuracy as a goal beyond a line or two for the first three or four weeks. Therefore, it not only encourages bad technique habits but slows down the keyboard learning materially.

In the third learning stage, advanced skills, the training is carried to the highest level of skill of which the student is capable. Briefly, this is accomplished by improving and polishing the basic skills, by eliminating all waste effort or false motions, by studying and analyzing errors made, by perfecting the machine operation with its timesaving devices, and by the development of a mental control that can be relied upon.

The fourth and last learning stage, practical application of skills, involves the forms that every good typist must know if he is to make practical use of his skill either personally or vocationally. Its learning begins after the keyboard is completed and continues throughout the entire course. It may even be said that this learning stage never ends, for with each new use of the typewriter new learnings in skill application arise.

Each of these four learning stages requires an essentially different learning procedure. The first task in learning to typewrite is to build up a body of efficient movement patterns for each letter and character on the keyboard. When the learning is well under way these movement patterns begin to unite for the writing of all letter sequences that occur in the commonest words. As these learnings are taking place a greater knowledge of the parts of the machine is acquired as well as a higher level of skill in the technique of their operation. Practice throughout these first two learning stages follows the order of development from a low to a high level for each new learning encountered. Practice in the third stage consists of writing continuity copy with ever increasing fluency, until the student's skill is perfected to the level of his physiological limit. While his skill is progressing from the basic to the advanced stage, there is much to learn in order to use the typewriter effectively. These "practical applications" vary considerably in difficulty, ranging from simple learnings like horizontal or vertical placement, to the more complex ones, like setting up a piece of tabulation. The same teaching procedure is used for all—the teacher presents, explains, demonstrates or illustrates, perhaps tests each new learning carefully. The student's part is to practice until the learning or skill is perfected and thereafter to continue to practice regularly to maintain it on a high level.

The First Instruction The first instruction in typewriting should be made as interesting as possible so that the student's desire to learn is kept alive. The amount of work covered in any one period depends on the length of the period and the group of students. Too much should not be attempted, especially in the first few class periods.

After the work is under way and a classroom routine has been established, the momentum of the previous lessons should carry the class along and prepare the students for the new work. No matter how many times a teacher has started a beginning typing class, the lesson plan should be revamped and revitalized not only for the benefit of the student but for the profit of the teacher as well. For the inexperienced teacher, careful planning is essential—for the first recitations, at least.

The student must be given the opportunity actually to type something—a few characters, at least—the first day. Students should leave the typing class each day with the feeling that they have made a decided step forward in their work. Admitting that a student may become a good or a poor typist during the first weeks of the course, the teacher should realize the importance of constant supervision during this habit-forming period. Criticism should be constructive, teaching intelligent, and patience infinite. In no course in the school is it so easy to assign a task and then settle down to other interests as in typing, and in no place can greater harm be done by such practice. It is by constant supervision and unceasing energy that success is attained.

Organizing the Class In allotting the time for the classwork of the first recitation, some time must be allowed for class organization. This will include assigning students to seats and tables that will give them comfortable working conditions. A seating chart, especially for large classes, should be made later to make attendance checking easier. At later class sessions, directions may be given for keeping the typing room neat and orderly.

Students should be taught to assume responsibility for the room conditions, particularly their own desks. Do not take too much time for these class organization matters. A few suggestions each day will suffice until things are regulated. Don't lay down too many rules of conduct, especially on the first day.

Teaching the Machine Mechanism One objective of the beginning work is to acquaint the student with the general mechanism of the machine and to teach him the manipulation of the parts.

The first day he should be taught the parts of the typewriter that are to be used that day. Then, as the need arises, the other parts should

be presented. If the teacher is at ease and shows absolute familiarity with the machine in its demonstration, the student will be less self-conscious. The following machine parts may be taught during the early recitations, the remaining parts being presented as the student has need for them.

The frame, or enameled part of the machine, in which the various parts of the machine are assembled and held together

The carriage, or movable part, which moves across the machine with each key stroke

The cylinder, or platen, around which the paper is rolled

The carriage return or line space lever, to bring the carriage back and space up for each new line

The carriage release springs (right and left), to move the carriage quickly in either direction to any point along the scale

The carriage scale, bearing white sections corresponding with the spaces in the writing line

The printing indicator, to indicate the point on the scale at which the next character or space will appear

The margin stops, to regulate the length of the writing line. These may operate on the carriage scale, on a rack at the back, or, in the newer machines work automatically and be invisible

The paper rest, or table, upon which the paper lies in the machine

The paper bail, or clamps, to hold the paper firmly against the cylinder. The clamps are adjustable for various paper widths

The paper guide, to direct the left edge of the paper into the machine

The paper release, to loosen the paper for straightening or permit silent removal at the end of the work

The cylinder knobs (right and left), at either end of the cylinder, used for turning the cylinder forward or backward

The line space gauge, to regulate the spacing between lines. It is operated by the line space lever and permits single, double, or triple spacing between lines

The keyboard, consisting of four banks of keys that are operated for the printing of the characters

The space bar, to make the space between words. It moves the carriage one letter space for each stroke made on it

The back spacer, to move the carriage back a space at a time

The shift keys, used for making capitals or upper case characters

The teacher must choose the method, teaching devices, and procedures that he will use to teach these parts. He may use the illustrations in the text and should have a typewriter on a demonstration stand with which he can point out those parts to be used in the first operations.

The demonstration machine should be raised high enough so all students can see it, and so that the teacher, standing, will have a good writing position. In this way an entire class can be shown, quickly and correctly, how to operate the machine parts. The ideal demonstration stand was discussed in Chapter III. Conditions, however, are often not ideal, and then it may be necessary to utilize whatever arrangement can be made. Expert performance of each step should characterize the teacher's demonstration, but the student should not be harassed by being forced to attempt expert performance. Naturally, the more nearly the student approaches expert performance on his first efforts, the better, but failure to respond does not foreshadow lack of skill possibilities. Each operation may need to be demonstrated more than once. Be as deliberate and vivid as possible.

Students should try to learn the correct name of each part of the typewriter as it is presented. This may necessitate reviews in later class hours. Most textbooks use a uniform system of numbering the parts. The teacher should direct the interest of the students and have them learn the use of the machine parts by using them understandingly.

Teaching Machine Manipulations Next the students should be taught the important mechanical operations. Some teachers prefer that these precede the operation of the keyboard, others teach them along with the machine parts, while some think it better to keep the two separated. This too should be taught by both explanation and demonstration and will afford opportunity for some experimentation on the part of the student. However, this experimentation should not allow the student to shift his attention from the teacher or lose out in the progress of the class. The student experimentation sets the problem, and teacher demonstration will show the right way to perform the operation. The teacher should not strive for perfection on the first few days in any of these operations, because much practice may be necessary to establish the habit of clever manipulation and some students may never reach that stage.

Space Bar Operation The space bar is operated by the right thumb, unless the student is entirely left handed, when the left thumb is more natural. The bar should be struck in the center with a short, quick stroke with the side of the thumb, and released quickly to prevent the error of no space between words. If extra spaces occur, the bar is being released too slowly or held too long. The main point of emphasis for the movement is that the thumb must be removed from the bar

completely, and the movement must be made without finger interference or movement. If the thumb is too tense, the fingers may fly up as the bar is struck.

The teacher should explain the movement and then demonstrate it. Since the space bar is the most frequently used part of the typewriter, its accurate operation requires daily emphasis. Some typists tend to strike the bar too hard, or with a flopping hand movement, or have the thumb too high on the bar, resulting in a shadow *n* in the space between the words.

Return and Release of the Carriage The return of the carriage should be taught next, and with it the use of the carriage release and the line space gauge. Explain the three kinds of line spacing—single, double, triple. Explain how the gauge is set for each of these and have students set the machine for single spacing. Line spacing need not be taught the first day, but will be needed the second day. Then explain and demonstrate the carriage release springs. It is necessary to steady the carriage when using the release spring. This may be done by the thumbpiece or by dropping the thumb beside the paper bail. This keeps the carriage under control. The release spring should be held down by the second finger to prevent interference of the third and fourth fingers. This position also brings the hand up into a more level operating position. This will free the first finger for the operation of the automatic margin stops on some machines. Carriage drag will be prevented by holding the spring firmly.

While the student is not expected to attain perfection in carriage throw the first day, the teacher is expected to teach it as flawlessly as possible. This will require a clear explanation of its technique and a demonstration that the student can imitate. Correctness of movement, rather than speed of throw, should be stressed—just enough speed to keep the operation from becoming sluggish, but never such speed emphasis that correctness of form is disregarded. There is quite general agreement on the following outline of technique.

Operate the line space lever with the nearest hand. Move the hand palm down, fingers bracing one another, to the line space lever, striking the lever just in front of the midpoint of the first finger. Throw the carriage with a forceful wrist movement (not an arm sweep) so it will return to the new line swiftly without banging, dropping the hand to typing position by the time the carriage reaches the left margin. Avoid looking off the copy during carriage throw and after it. Besides returning the carriage for a new line, the operation of the line-space lever automatically spaces the paper forward according to the way the gauge is set.

after which there may be some individual practice. Close the practice with the paper straightening instructions of Step 3 above. Then leave the paper in the machine.

Setting the Paper Edge Guide The paper-edge guide is set so the center of the paper corresponds with the center of the writing line. The left edge of the paper should follow the edge guide into the machine.

Many sizes and styles of type are available to users of typewriters, but pica and elite are the most common. Pica type, which types ten characters to an inch, is used generally in schools. Elite type, which types twelve characters to an inch, is becoming more popular in schools, because of its increasing popularity in business.

A standard sheet of typing paper is $8\frac{1}{2}$ inches in width, or 85 pica and 102 elite spaces. Typewriter scales, if pica type, are 80, 85, 90, 95, and 100 spaces, while elite type has scales of 96, 102, 108, 114, and 120 spaces. Centers for pica are 40, 42 or 43, 45, 47 or 48, and 50. If machines of varying scale lengths are used in a classroom, the paper edge guides may be set to center the paper at a uniform point, say 45, if the scales are 85, 90, and 95. Then the same margin stop settings may be used by all students. This is especially desirable in the early training work.

To set the paper-edge guide, make a short crease in the center of the paper at the top and insert the paper in the machine with the carriage indicator at whatever center is to be used. Adjust the paper so that the letter *m*, when struck, will fall exactly on the crease in the paper. Move the edge guide to the paper margin. Read the scale under the guide, for it will show where to set the guide in the future and paper creasing will not be necessary. Paper scales differ on the various machines. Paper creasing is unnecessary on some, for any size of paper may be centered when inserted so that the scale readings on the left and right agree.

Setting the Margin Stops The margin stops determine where each line begins and ends, hence they control the length of the typed line. On all machines except the old Underwood models, the margin scales read from left to right.

The margin stops are set an equal number of spaces to the left and the right of the center of the writing line. At first 5 extra spaces may be allowed on the right to take care of irregular lines, but after the marginal release is taught, the extra spaces need not be used.

Five different line lengths are used in typing. The very short line of

30 spaces, the short line of 40 spaces, the average line of 50 spaces, the long line of 60 spaces, and the very long line of 70 spaces. With elite type, these may be extended 10 spaces, which would make the very long line 80 spaces in length. Since the smaller scale points are more difficult to distinguish and use, it is recommended that in the early lessons or even for the first year, the margin stops be set according to the chart given below and that the use of the 42 or 47 center points be avoided.

PICA SPACING

45 Center		50 Center	
Left Margin	Right Margin	Left Margin	Right Margin
30	60	35	65
25	65	30	70
20	70	25	75
15	75	20	80
10	80	15	85
—	—	—	—

ELITE SPACING

60 Center	
Left Margin	Right Margin
—	—
40	80
35	85
30	90
25	95
20	100

Should a line 5 spaces longer than the above be desired—35, for example—the 5 spaces would be taken from the left margin. Thus, the stops would be set at 25 and 60 for a pica 35-space line. These odd line lengths are not used often, some books and teachers never use them.

Setting the Line Space Gauge At the left or right of the cylinder, and marked usually "1 2 3," is the line space gauge used to indicate the kind of spacing available. There are three kinds: single, when the lines are written just as closely as they can be and not overlap; double, when each line is written on the second line below, leaving one blank line between lines; and triple, when each line is written on the third line below, leaving two blank lines between lines. While the line space lever is returning the carriage for a new line, at the same time it automatically rolls the paper forward for the new line according to the way the gauge is set. When single spacing, a double space is inserted between paragraphs and practice units by a second operation of the line space lever after the carriage has been brought back. The gauge is not changed. No extra space between paragraphs is used when double or triple spacing, but the paragraphs are indented.

Keyboard Operation. Touch typewriting is made possible by dividing the keyboard scientifically and thus assigning certain keys to certain fingers. The keyboard is first divided into two divisions, the left

and right for the fingers of each hand, then each division is divided into as many sections as there are fingers to operate them. In each of these finger sections a key is chosen on the second bank to be used as the base of operation for that finger. These base keys are called home-key position. To make this clear, the student should have a diagram or chart of the keyboard before him. This may be in the text, or the teacher may develop the keyboard by diagramming it on the blackboard. This is an excellent time to stress correct fingering.

Technique of Operation Technique of operation includes those things that contribute to the general writing form and hence, in large measure, determine the skill that will be developed later. They should be taught quickly, yet effectively, for the student probably knows that the time for doing his first typing is near, and he eagerly anticipates that experience.

Method of Stroking the Keys The method of stroking the keys should next be explained and demonstrated. One can talk at length about sharp stroking, curved fingers, key release, and yet fail utterly to give the correct idea. A few minutes spent demonstrating the difference between the sound of sluggish key pushing and quick, snappy strokes makes the meaning clear. There are so many fine points a teacher should know about this stroking technique that a more complete explanation will follow later in this chapter.

Posture at the Machine The student's posture at the typewriter has a very important influence on his typing. The habit of assuming a good position at the beginning of the learning materially aids the attainment of speed later. Teachers should realize that *how* the student types is more important than *what* he types and adjust their teaching emphasis to it. It is not enough to tell the student what is correct position, he should be given reasons for the necessity of considering all the items that make up correct posture. He must establish the habit of using this knowledge and fix it as one of his many typing habits.

The importance of correct posture has been adequately appreciated by only a small percentage of teachers, although it has been greatly emphasized in all material on the teaching of typing. One of the fundamentals of modern efficiency in any operation requiring skill is that there is *one best working posture* for each individual. Available equipment determines how far the teacher can insist on correct posture. While the individual differences in physique make it impossible to specify a particular posture for all typists, yet there is a range in posture

that can be outlined well enough to admit of general application. The points that make up this uniform posture are as follows

1 The typist should assume a natural upright position directly in front of the machine, with the feet on the floor, one foot slightly in advance of the other to give better balance to the body. In fact, the general position of the body should be as perfectly poised as that of the runner who crouches for his race.

2 By sitting well back in the chair and leaning slightly forward from the hips so that the shoulders do not touch the back of the chair, an appearance of alertness may be given to the body.

3 The elbows should hang loosely at the sides and be kept near, but not close to, the body.

4 The wrists should be lower than the knuckles, the elbows slightly lower than the wrists, and the upper arms slanting a bit forward. In general the hands should slope with the slant of the keyboard and the wrists be kept low but not resting on the frame of the machine.

5 The fingers should be comfortably curved and placed lightly on the second bank of keys.

6 The head should be turned slightly to the right at the same angle as the copy is placed on the desk at the right of the machine so that the copy may be read easily.

The typewriter table and chair should be so adjusted in height that the elbows are slightly below the level of the table. If the table is too low or the chair too high, the elbows will be above the table. Many teachers allow their students to sit too near the machine because students have a tendency to sit in close in their eagerness to work. This causes stiff fingers and restricts hand movements because the wrist is cramped. The wrist must be the balancer of all finger movement. A typist cannot obtain the maximum amount of work from himself or from his machine if the arms are too close to the body or the body too close to the machine. The length of the arms or hands and fingers should determine the distance the student sits from the machine. If he sits too far from the machine, muscular strain will be felt in the extended arms. If the chair is too low, the palm of the hand and thumb will sag to the typewriter frame, or the effort of keeping the hands at the right level will tire the supporting muscles. The wrists should be lowered enough to be relaxed and about on a level with the space bar, but they should not rest against the frame of the machine. There should be complete relaxation of the entire body. Briefly, the position should be such as to give the poise and balance that are necessary to maintain perfect ease of operation. Rigid neck, stiff arms, cramped or

drooping shoulders, tense facial expressions, bowed elbows, are all forms of rigidity that must be avoided, because they will retard speed later and encourage errors at any time

Placement of the Copy If the student is going to type right, he must read the copy correctly. Therefore, the placement of the copy for accuracy and ease of reading is important. It is believed that the eyes read more accurately from the right, therefore the copy should be placed at the right of the operator. Another important factor is the angle at which the copy is placed. It should be raised by a copyholder to the height best suited to the vision of the student. It should be placed at the same angle that the head is turned, so that the line of vision will be as direct as possible. This reduces eyestrain materially, for if the copy is placed square with the table, the eye must change focus constantly as it moves across the line. Therefore, teach the student how to set up his book on the copyholder and explain the importance of its correct placement.

The First Typing While there is much to teach on the first day, the student must do some writing on the machine. He is anxious to see something he has produced and will be disappointed if this desire is not gratified. Striking *m* to center the paper and striking *f* and *j* to check the accuracy of home position can satisfy this desire in a short period.

The first practice should be stroking drills to start the development of a good key stroke. A stroking drill is the repetition of a letter, like *fff* or *ffff*, three or four times, never more. The strokes should be made as rapidly as possible, evenly timed, and followed immediately by the space stroke, after which there may be a pause for relaxation of the finger tension. The purpose of the stroking drill is to develop the finger movement. Therefore, a slow pace in writing it will defeat the objective, which is rapidity of movement to give the finger the feel of fast motion. Its purpose is not to teach the letter location, therefore the drill should never be written in slow metronomic rhythm for accuracy emphasis. It should be a quick snappy pace and represent a group of movements rather than a series of repetitions of a single movement. These drills should not be dictated by the teacher unless in very fast time with a relaxation pause after the space stroke following each group. Students can usually write them faster than a teacher can dictate them.

Since the fingers must be trained to make a correct stroke, the stroking drill can carry much of the burden of that training. Such drills

serve as gymnastic exercises also and have that value, if nothing more. They become harmful only if used to excess, so that the fingers are too fatigued for other writing, they lose their value if they are written slowly and methodically. If students are allowed to look at the keys during their first efforts to strike new keys, they will have a more accurate mental impression of the movement necessary for the reach.

The Home or Base Position The first approach to actual typing requires setting up the correct home position for each finger. Home position is much more than a matter of locating the fingers on the eight home keys. It is much more than a matter of sense of touch. It is a matter of establishing a strong kinaesthetically controlled position of the fingers, hands, and arms in which the typist is completely relaxed, yet ready to command each finger to leap into swift accurate action. These eight keys, *asdf jkl,*, called the "home row" or "base position," play an important part in the writing of the student, in fact, they make touch writing possible. (The sight writer does not use a home position.) At the beginning, the location of each key is measured from the corresponding home key. Later, the home keys keep the hands in proper position for accurate work and keep the fingers close to the keyboard, thus aiding the acquirement of speed.

The finger should approach the key to be struck along the most direct line from the home key, at first with enough deliberation to produce accurate control of the nerves and muscles of the hand. A lack of deliberation, due to *hurrying or too fast writing*, will result in a loss of finger control—the fingers will stagger around over the keyboard, discharging nervous and physical energy and accomplishing nothing. The fingers should return to home position after striking a key. Therefore, drill in getting back to home position after spacing and after returning the carriage, as well as after striking each key, is necessary, for it will enable the typist to locate the following key much more quickly and accurately.

Students will be interested in knowing why these eight keys were named "home keys." The simile is simple. The home row is a good place for the fingers when they are not writing, and to return to after their work is done. Home gives a feeling of protection and assurance, so the fingers, if in home position, have a feeling of confidence. The newer name for these keys—base position—makes it easy to stress their importance to the baseball fan. Also, since they are the base of operation, they may be likened to the base position of an army.

The standard keyboard has four rows, or banks, of keys, counting up from the space bar, and these are divided vertically into two divisions in which each hand operates. Each division is divided into as many vertical sections as there are fingers—four for the normal individual. Since the fingers must operate up and down within their own vertical section, it is expedient to have a base for such operation. This base can best be located on the second row of the keyboard, because reaching up is easier than reaching down.

To present the home, or base, keys as vividly as possible, the teacher may develop a diagram of the keyboard on the blackboard as their explanation proceeds and demonstrate how the hands appear when held in home position. The students may look at the keyboard during this explanation as well as in their first attempts to place their fingers in home position. They may check the accuracy with which they assume the home position after each attempt, by looking at their hands. Teach them to *visualize* this home key position of the hands and then to *assume it kinesthetically* while keeping their eyes off the keyboard.

Individual work with each student is essential to obtaining the best results in finding the home or base position quickly and accurately, and frequent checks are necessary for several days, maybe weeks. Kinesthetic sensations must be developed in the fingers, hands, and arms until such sensations are strong enough to place the fingers in the correct home position automatically. Only practice will do this.

Some Physical Differences It is not possible to consider here the many problems of physical differences that affect the teaching problem of typing, but a few must be mentioned. Experiments have verified a long-existing doubt that some specifications of posture are satisfactory only for certain individuals. The analysis of motion pictures of typing action indicates that the key to the problem lies in hand construction. A normal hand has a minimum amount of flexibility in the finger joints. Its fingers are more limited in their independence of motion than the fingers of other types of hands, which, in extreme cases, are "double jointed" fingers. These have greater flexibility and independence of motion. The fingers of the normal hand require more hand motion than the fingers of the double jointed hand. To maintain operation without tiring, the normal hand performs its work with a deeper arch than the more flexible hand. Usually, with the latter type of hand, only the visible portion of the finger is arched from the knuckle joint. With the

normal hand, the arch is longer and extends from the finger tip to the base of the hand, where the finger bones end at the wrists

Students having double jointed fingers may be spotted the moment they begin striking keys. Their hands are so flexible that the front edge of the palm sinks down and the wrists rise as the fingers deliver the blows. Such students must sit somewhat higher than students with normal hands, to keep their wrists high and prevent the body of the hand from continually striking the keys. The extent of the differences in hand wrist and arm position varies with the degree of double-jointedness.

Whatever the type of hand, the position of the forearm is probably the key to the whole situation. The forearm *must* slant upward—sharply for the normal hand, and at least slightly for the double jointed, or flexible, hand. If the forearms slant down from the elbows to the wrists, as they do with most students, because they are forced to sit at tables that are too low, the hand and arm muscles quickly become tense and uncontrollable. The wrist stiffens, forcing the student to try to type with wrong muscles, wrong motions, and generally a forearm motion pivoted at the elbow. The teacher should do whatever he can to obtain an upward slant of the forearm, if he wishes to get results. Extension feet or wooden platforms under the typewriters will help. If students are seated too low on nonadjustable chairs they may sit on books or other available objects.

One should not lose sight of the fact that the fingers are the parts of the body most concerned with the principal work to be done. If compromises in matters of posture must be made, every effort should be exerted to maintain correct finger and hand posture in order to provide for a maximum exertion of energy with maximum provision of relaxation. The proper equipment of tables and chairs of varying heights will aid greatly. Students should be seated the first day on the basis of a rough analysis of their needs, their seats being changed during the first week until the best possible seating arrangements have been made.

It is a waste of time to explain correct posture to the student in too great detail at the outset. He possesses no basis for appreciating such instruction, and it only deadens his interest and frustrates his natural desire to type. Students should be directed frequently during the first two weeks to compare their positions with that illustrated in the text, and the teacher should keep the details of correct posture in mind at

all times, offering suggestions that will aid individual students in acquiring better posture. Wherever possible, these suggestions should be linked with the idea that failure to observe these details curtails some particular skill, increases fatigue, etc. Regularly during the first semester, and occasionally throughout the remainder of the course, a "posture check list," of which there are several, may be used to check individual technique. The student may keep the check list subject to the teacher's request to use it. The greatest gains will be made through specific suggestions that can be offered by the teacher at the moment he observes mistakes in posture. The habit of sitting always in as nearly the same position as possible while typing should be acquired. When the typist changes his position, his keyboard reaches necessarily change, and errors are encouraged.

A copyholder is a great aid in securing and maintaining a good position. The light should be from the rear or left, so that the student does not face it. The practice of copying from the right side has been justified by psychology and physiology, most people are right handed, and this fact usually results in a generally superior development of the entire left side of the brain, which governs the right side of the body. This explains why right handed persons usually possess better vision and hearing on the right side. Anatomists have observed that the left hemisphere of the brain develops somewhat earlier than the right. In consequence, more nerve impulses may be transmitted to the muscles of the right, with ensuing greater development, causing a definite inclination to right handedness.

While most typists copy from the right, students should learn how to type from the left side too. In many offices, desk construction or the exigencies of work make copying from the left a necessity. If the light falls upon the left side of the typewriter, then there will be better lighting of the copy for left side reading. Typists have unnecessarily strained their eyes and brought about permanent curvature of the spine by copying excessively from one side or the other. Advanced students may be trained to work from either side, yet they should know that most typists can attain their greatest output by working from the right.

Handedness approximates a curve of normal distribution, with relatively few acutely left handed and a considerably larger number more or less ambidextrous. Many of the normally ambidextrous may become notably right-handed because of adaptation to the dominantly right-handed environment. The number is really significant in any school

whose philosophy stresses attention to individual differences. In most schools, no provision is made for furniture and equipment for left-handed students, and lighting, windows, and seats are arranged for the best interests of the majority. Certain adaptations seem feasible because educational efficiency depends to a great extent upon these things. Freedom to be left handed is insufficient. The student should be educated in left-handedness, hence have equipment, instruction, and guidance that are adequate to his needs. It is more natural for the left-handed student to space with the left thumb than with the right.

Key Stroking. Key stroking is the barometer of the speed development of the beginning student. If he learns to stroke sluggishly, he will be a slow typist, but if he learns to stroke rapidly, he should acquire speed.

As key stroking is difficult to explain, it should be demonstrated by the teacher, with only a brief preceding explanation. Too much talking at one time clouds the idea to be conveyed, so explanation, demonstration, practice, then more explanation and demonstration, are the best policy for teaching this technique. Hearing a sluggish stroke and then a snappy stroke can give the correct impression for imitation.

The finger tips should do the actual work, never the face of the finger. Closely rounded fingernails enable the fingers to perform their work more effectively because the fingers can feel the keys with greater sensitiveness. If the nails are long, adjacent keys will be clipped and errors will result. With the fingers well curved, the wrists relaxed and low, the student should hit the center of the key each time. The fingers should be kept as close to the keys as possible. The first and fourth fingers are inclined to fly up when the other fingers are making strokes. The third and fourth fingers may shirk and let the wrist stiffen to strengthen the stroke, and the tense wrist will soon become tired.

Three factors make up stroking: (1) making the reach to a given key, (2) striking the key, (3) getting the finger off the key. Soon the first two movements become merged into practically one operation, the finger gathering momentum as it makes the movement. At first in typing, much of the attention will be occupied with key location or key reaching until the movements to the letter locations are so well fixed through the kinaesthetic sense that little attention need be given to the movements. The recoil movement from the key must have its share of emphasis.

Watch the resulting mechanical action of the type bar when a key is

struck. To allow the key mechanism to function properly, the key must be released instantly upon the impact, so that the type bar may snap back into place and give clearance for the next key. This becomes even more important as the speed of the stroking increases, because of mechanical considerations. If the keys are struck with a sharp, positive stroke, the type bar will have a chance to snap back into place quickly. When the stroke is properly executed, the finger is off the key before the type strikes the cylinder. Striking the key with a sharp, quick stroke, with instant finger recoil, has a psychological effect that is important; it energizes and speeds up the stroking and intensifies the "feel" of the stroke. Even at the start, the stroke must have a fair degree of speed to give the correct "feel" of the motion pattern.

The amount of power delivered on each key stroke has an important bearing on speed. It should be enough to give a clear impression of the letter. This can only be ascertained by individual experience. It is better to use a somewhat too powerful rather than too light a stroke; but the important features are clear-cut strokes and even impressions.

Just how far the typist lifts his fingers above the keys, how he reaches from one key to another, how he delivers the power, and particularly how he gets his fingers off the keys, are all points that need special attention. It is an art to learn to strike keys with exactly the right touch and make all letters of the same density. The proper stroke for the development of such a touch is a quick, decisive blow to the center of the key, with instant release—a well-timed operation. This is largely a finger stroke, requiring little wrist or forearm movement.

Getting the finger off the key quickly is of greater importance than the speed of striking. The key should never be held until the reaction of the mechanism of the machine is felt. When the finger follows the key down and back, the action is called key-pushing, a slow, labored mode of writing. The key should be struck with enough force so the bar will travel to the cylinder, and the finger can release it or get away as soon as possible. The effects of a sluggish getaway are these: double impression of letters, piling of letters, failure to space between words, extra spaces sometimes, and a heavy impression of letters that may cut through the paper. A heavy touch is not always caused by sluggish getaway, but often is the result of lifting the fingers too high above the keys.

The punctuation marks are sharp and will puncture the paper if the keys are struck too hard. If the fingers are kept curved and in home

position when not in action, the period and comma, because of their awkward position, cannot be struck so hard. The hand should not be shifted downward to strike these keys.

After the student has mastered the keyboard and finger movements, it is no crime to lift more than one finger at a time—in fact, he will do so, if he is adaptable, and not lose his position on the keyboard. His muscular coordination is such by that time that the hand will return automatically to its correct position, and there will not be many stray fingers.

Sluggish, hesitant strokes at the beginning can easily develop a habit of slow writing that cannot be corrected. While the stroking should flow with regularity and evenness, yet it should not possess this quality to such an extent that stroking is metronomic. The rhythm is a wave rhythm. A quick, rhythmic stroke, keeping the letters of the word and its following space in a unit or group, may be rapidly secured. The use of the pause following the space stroke is essential to restore and to develop control of relaxation and to gather up and direct energy for the next unit of action. The pause will shorten as familiarity with the motion pattern grows. This mode of stroking conserves energy and assures better finger control. The purpose of rapid stroking on the initial keyboard drills is to insure correct stroking of the key. This is not gained by analyzing the stroking technique for the student, for correct technique is acquired as the result of the practice. It comes with rapid stroking. From the beginning, the student senses the correct feel, and the printed letter is so clear and even that he at once gets a feeling of satisfaction.

The Use of Rhythm or Timing. For many years rhythm has been regarded as an essential factor to be attained in the pursuit of typing skill. The teacher who favored it urged students to strive for it to develop ease and agility of movement, believing it to be the important device for aiding the student in overcoming his self-consciousness and bringing his awkward or clumsy fingers under motor control. In the late nineties devices for developing rhythm began to be introduced. A. C. Van Sant, one of the pioneer teachers of touch typewriting, introduced the oral dictation of one letter after another in even time. About 1914, Victrola records became a rhythm device. Other devices have been the tapping of a ruler, counting the key strokes, the metronome, and the more modern electrically driven devices that trip a hammer on an anvil and can be set to operate through a wide range of

stroking speeds The dictaphone "ticker" may also serve as a rhythm device

The entire movement in favor of rhythm and all the many devices used for teaching it are the result of years of experience in teaching typists who could not achieve speed and accuracy because their typing was characterized by jerky stroking and a lack of evenness or timing Broadly stated, rhythm denotes symmetry, proportion, and division, and it can suggest action that conforms to the laws of co ordinated movement.

The interpretation has been that rhythm is metronomic—a set pace in which equal time intervals separate all strokes Scientists have known for some time that perfect metronomic rhythm was a fallacy, yet the typing profession continued to ignore it Teachers thus directed their students toward an impossible or unattainable goal Metronomic rhythm is an unnatural mode of stroking, where maximum output is the objective However, it must be admitted that it does aid stroke control, a factor in accurate writing Teachers developed accurate but habitually slow typists by insistence upon metronomic rhythm

Between 1915 and 1918, J E Coover and E G Wiese did some experimental work in the psychology laboratory of Leland Stanford University, in California, in which they thought they had proved the use of rhythm in typing to be a disadvantage It is now evident that what they proved was that habitual metronomic rhythm was a disadvantage, or, rather, that the rhythm used in skillful typing was not metronomic Their experiments were based upon a determination (in hundredths and thousandths of a second) of the timing of each key stroke and proved that the rates vary for striking the different keys, thus permitting some keys or combinations to be written faster than others This is just what the present conception of rhythm contends Rhythm is now interpreted to be a flow of stroking in which the easy combinations are typed at a faster tempo than the hard combinations Difficult combinations within the word or a long sequence of letters, as in a long word, may slow up the flow just as easy combinations can speed it up Difficult combinations are like hurdles, the faster the writing the higher a hurdle they become In track events, high hurdle men have greater difficulty "keeping smooth" than the low hurdle men, and the low hurdle men have more trouble than the dash men Most material written by a typist combines the high, low, and no-hurdle type (difficult, average, and very easy) In walking or dancing, one

does not make each step of the same length, yet there is a sequence or flow of movement that is really rhythmic. Such rhythm is smooth, fluent, even rippling.

This changed idea of rhythm brought with it a modification of the use of music or the various pacing devices. It is true that music has fascination for the students and for a time will inspire them to their best efforts, but a lack of variety of records soon makes repetition monotonous and the beneficial effect is gone. An objection to music is that it makes all the group write at the same tempo instead of allowing for individual differences in rate. Also, it prevents a slowing up for the difficult word or sequence or a speeding up when the writing can swing along at a faster pace.

This interpretation of rhythm must not be confused with the old spasmodic writing used before rhythm was introduced. Spasmodic writing is still to be discouraged, for it is a scattered effort mode of operation that encourages tenseness, errors, and nervous "crack ups." Most typing can be done in changing tempo and the regimented time be used to give evenness to the groupings of the strokes. If the music could be fitted to the material, then music might aid the typist. As music consists of various tempos that give it color and harmony, so material to be typed consists of easy and difficult combinations blended together in harmony.

Whether teachers and students realize it or not, students striving for metronomic rhythm must necessarily type at less than their best speed. There is plenty of proof that emphasis on metronomic rhythm severely limits speed, initiates and nourishes errors in technique, encourages slow, incorrect, unnecessary responses of mind and hand, and sidetracks the skillful typing goal of "right motions at right speeds" for the false and unrealizable goal of perfect rhythm.

Technique, or Good Form Everyone knows how the successful athletic coach insists on good form and recognizes the advantage the athlete has over his rivals if he performs his feat in the best way—the most effective way. So in typing there is a best way, a good form called "technique."

The early stages of practice must lead as directly as possible to expert performance, so every detail in the early training of the typist should be planned for its direct contribution to the good form of an expert. Habits that are bad for the expert must not be built up during early practice.

The acquirement of technique or good form requires a great deal of concentrated attention; and in order to accomplish the most, this attention should be voluntary. Good form demands a fair, regular, continuous procedure unmarred by gropings, confusion, and interruptions. Anything that destroys the smooth operation of the desire-for-skill or the keen mental control of the whole performance is an enemy of the best form. Because fear paralyzes action, the fear of making an error induces groping and key watching and prevents good form. Practice is not work if the typist becomes really interested in perfecting his technique. Therefore the first task of the teacher is to motivate the student's efforts by stimulating his interest in the best writing form of which he is capable.

It is extremely important that the beginner be carefully instructed in the individual movements that shall later develop into a co-ordinated whole. As in the training of the athlete, where every distinct motion or exercise is later revealed in its relation to the perfectly rounded performance, so each motion of the fingers on the typewriter should be especially developed with a view to that perfect co-ordination that is later seen in fast, accurate writing. This does not mean that the teacher should supervise every motion, but it means that the instructions given be most skillfully prepared and presented.

Learning the keyboard involves the learning of many elementary movements, which must be practiced by themselves to strengthen the muscles and to achieve perfect control. After these movements are mastered, the beginner can combine them in easy words and phrases, just as the dancer combines the easier steps. In this way he can build gradually the short sentence, the paragraph, and finally the theme. Even after the athlete becomes proficient, he constantly practices his elementary movements in order to maintain or improve his top form. After a typist acquires a high speed, it is good practice to review various elementary movement drills to improve the particular movements *he* needs to improve. Improvement should be sought on the highest level possible, remembering that the manner of making the movement is far more important than the mere letters typed. There are skeptics who see little use in such combinations as those used in the elementary movement drills. This same theory once prevailed in athletics, when coaches taught their athletes to play and run without setting-up exercises. But the modern coach sends his men through similar separate motions to develop special muscles. Likewise, in the typing classroom

may be found work on finger facility drills for skill candidates. Just as the application of scientific coaching methods has resulted in better athletes and higher records, so an application of the same principles in the training of typists should develop better typists. The role of the typing teacher is that of a coach of finger athletes, not a dispenser of knowledge alone.

Skill Dependent on Habits Formed If a person wishes to become a skilled typist, he must remember that the first month's work may be of greater importance than the work that follows, because habits will be formed during those first weeks that may decide his skill attainment. Impatience to proceed in the work is generally the cause of the formation of bad habits by the beginning typist. When the mind, muscles, and nerves are trained to follow regularly a certain course of action for a long time, the habit becomes second nature, almost impossible to change. The fatality of learning a thing wrong is easily seen, and the time or effort spent in correcting them later is worth consideration.

It was the psychologist James who first taught that in forming a new habit, an exception should not occur until the new habit is securely rooted. Each lapse is like letting fall a ball of string that one is carefully winding, a single slip undoes more than a great many turns will wind again. Fortunately, there are many disciples of this philosophy among teachers of typing, who, in starting beginners, try to guard against their ever performing any operation incorrectly. While this idea may be overstressed, yet there is no doubt but that such teaching saves many bad habits.

The teacher must know the directions to be given if students are to form correct habits, the difficulties that will prevent the formation of good habits, the ways of guarding against the formation of bad habits, and the remedies to be applied if exceptions have occurred. The teacher should not center the student's attention on his difficulties by harsh, untactful criticism or admonitions. Instead, emphasis should be placed upon *how* to do things the right way rather than what not to do. The directions that the teacher gives should be chosen so carefully as to make it possible for the student to succeed most of the time. Clear explanations and frequent demonstrations will help greatly to insure that the first attempts of the student will be with correct technique. Even after the right start has been given, students may lapse into incorrect methods.

The teaching of typing is a special application of the psychology of habit formation, which teaches that instincts and tendencies cannot be eradicated, but that they can be controlled and directed into useful channels. The fundamental factor in the fixation of correct habits of learning is to be found in the copy that the beginner must write. The most effective way to get the student to do a thing correctly is to make it to his immediate advantage to do it that way—to recognize and take advantage of the natural tendency to consider only the immediate objective, the exercise that he is engaged in writing.

The first thing most teachers attempt to teach beginners is the proper position of the hands and fingers on the keyboard. The student is primarily interested in operating the keys, and if there is nothing in the character of the work to keep the fingers where they should be, even the utmost vigilance will not accomplish the desired result. The remedy is to provide a motive that will show the need for keeping the fingers arched over the home keys and repeatedly demonstrating that technique.

One of the worst early habits the beginner forms is looking at what has been written. This is a natural tendency because the student is eager to see what he has produced and lets his curiosity get the better of him. He usually doesn't mean to begin a bad habit. Undue emphasis on accuracy tends to encourage this habit. Stressing the necessary habit of copy following can offset this tendency. Closely related to this habit is that of looking at the keys while writing. Both habits are due to a lack of confidence, and both are absolute preventives of speed. Performance of any of the mechanical operations of the machine without regard to economy of movement is an incorrect habit. Another bad habit is the tendency to extend the elbows from the body, thus throwing the hands out of proper operating position. This tendency develops usually when operation of the lower and outer keys is begun. It can be largely counteracted by careful supervision to prevent the unconscious formation of the habit.

The student should not be nagged into acquiring good habits, but the teacher must explain, demonstrate, and direct efforts with as much individual work as possible. If the student is impressed with the importance of forming good habits in his first efforts, the teacher's task of skill development is made easier. Youth forms and breaks habits easily, therefore, the younger the learner, the easier the work of establishing correct writing habits.

How to Use the Textbook. The teacher should choose the text that best fits his teaching methods. If his methods are old and he clings tenaciously to them, he will find great difficulty in using a modern text. The progressive teacher will intelligently weigh new ideas and incorporate the useful ones into his methods. Every teacher has his own pet theories and teaching procedures to which he clings, and which he feels are largely responsible for whatever good results his students obtain. Unfortunately, the trend in many schools is to establish definite teaching routines, which oftentimes involves the continued use of a textbook that is far outmoded. It is not necessary to change texts frequently, but they should be changed when it seems wise. Since "the proof of the pudding is in the eating," the use of the textbook will prove its worth.

To make the best use of a textbook, the teacher should study the preliminary material as well as all explanatory matter. The best way to understand the author's aims is to read the preface and any introductory material. The table of contents usually outlines the book, and the index saves time in locating particular types of material. The more modern textbooks contain excellent illustrations and diagrams that can be helpful in making clear explanations.

Administrators and supervisors have made a general demand on publishers to incorporate lesson planning in all textbooks or in a teacher's manual to accompany the book. This is asking a great deal of the author. They forget that a textbook must be written for use in not only the large city high school but in the small city and village high schools as well. Class periods in these different types of schools may range from 20 to 60 minutes and school years from 38 to 42 weeks in length. The best the author can do is to develop a lesson plan based on the average class period, say 50 minutes, and hope that the teacher can adapt the plan to the period length and school year of his school. Since the instructors of methods courses quite generally agree that the making of general lesson plans in advance is not practicable, then just how useful are those made by the authors of textbooks?

The teacher should know that the best procedures and routines must be adapted to the needs of individual students. In this adaptation lies the teacher's opportunity for useful employment of his own theories and devices. He also runs the risk of misusing or overusing these same theories and devices. He must be ready at all times to question the validity of previous judgments. He must test and retest each device.

and procedure, not by how well the students execute it according to the routine he may have in mind, but by the *results* that he sees and hears them obtain as they pursue their practice, using these devices and procedures. In attempting to use the lesson plan worked out by the author of a text, it is best that the teacher thoughtfully read the preliminary material presented by the author before attempting to study the plan. After that, the best procedure is to keep the textbook open to the lesson under consideration, when studying the plans and suggestions offered. The teacher should strive to master the teaching techniques thoroughly before meeting the class. Then, with a brief, topical outline on a card, he can proceed with certainty from one step to the next.

Unsupervised students will necessarily be restricted to the instructions as they appear in the text, because the teacher will have little time for demonstration and explanation. With this in mind, the authors of most textbooks have carefully organized the instructional and practice material in each lesson so as to provide unsupervised students with every detail necessary in order to achieve the minimum amount of learning planned for each lesson. Where learning activities are directed or supervised, the teacher should remember that long and serious thought has been given to the precise wording of every sentence and to the sequence of each instructional and practice step in the textbook lessons. Teachers are urged to follow the class routine accompanying the lessons in the handbook or teacher's manual, particularly as to sequence and time devoted to each step, unless they are sure their experience permits a more logical sequence and a wiser distribution of time. Oftentimes, the textbook instructions are cast in the words that an efficient teacher would use in addressing learners. The textbook is a cold mass of instructional material for the average student. Only as the teacher gives it warmth and specific purpose does it attain its true value and contribute its share to stimulate the student to work toward the aim that he sets for himself.

In selecting a textbook, the teacher should look for a carefully planned book that will provide organized teaching materials, that will guide but not restrict the teacher. No text should set up an inflexible demand as to class procedure, amount of work to be required, or the rate of progress to be maintained. A teacher's manual may suggest methods of handling the text material for the beginning teacher and give opportunity for the experienced teacher to compare the suggested

methods with their own lesson plans and class procedures, but it need not be a volume on methods of teaching the subject

Textbook assignments vary with the individual teacher in both method and amount. As he improves his technique of teaching, he invents a variety of individual approaches to the handling of the text material, in terms always of his immediate teaching purposes. Through such means, the text is made vital and interesting. The variety allows the student to focus his attention many times on the same technique, and to repeat this technique as often as is necessary without loss of interest.

Devices for Forcing Touch Operation While students can make rapid progress without any of the devices that help to force touch writing, yet not all have sufficient will power to become real touch operators. Most teachers possess sufficient personality to influence their students in this respect, making it a matter of pride to the student to keep his eyes away from the machine. Students can generally be made to take this attitude toward it. There is a growing opinion that some watching of the fingering when new keys are being presented is desirable for the development of correct stroking technique. This opinion has much in its favor. Whether such a plan is advocated or not, for the student of average intelligence or above, these few looks at the keyboard while he is learning the reaches are not going to develop the habit of looking. It is the fixed habit of doing all or even most of the writing that way that should be avoided.

There is a difference of opinion as to the merits of devices used for "blind writing." Blanked keys have been the most popular device and they are still used by some teachers. However, students can memorize the key locations by watching their hands even though the keys are blank. It just takes longer to acquire the art of sight writing. The authors of the early textbooks introduced the idea of using some device, when the mental approach of keyboard learning was used. They contrived many devices to help or to force students to memorize the keyboard, like wearing a paper band around the eyes or a metal shield over the hands. Such devices should not be used. If they are, however, they should be discontinued as soon as the key watching habit has been mastered, for there is no doubt about their interference with speed development.

Method of Learning the Keyboard The traditional method of teaching the keyboard is based on the part method, for which there are

several plans of learning. Expert typists have been trained by each plan, which leads to the conclusion that each one has some merit. Only one requirement seems necessary in a good plan for keyboard learning, and that is that the keys be presented in a logical and scientific order.

The oldest, and a much used, plan is called the "home row" method. In this plan the home row or base position keys are taught first, then, when the fingers can operate these keys, the remainder of the keyboard is taken up in logical order, two or four keys each lesson. The advantage most often mentioned for this plan is that it keeps all fingers in training at the same time. It requires considerable time to teach the keyboard. This fact was once believed to be an advantage, but it is now considered a weakness, since it has been found possible to teach the keyboard in much less time. The chief criticism of the plan has been that so much emphasis is placed on the home row that a tendency to cling too closely to it results, causing slower and more sluggish operation.

One of the most popular and successful plans is the finger section, or first finger first, or Rational method. By this plan the student is taught the keys that are written only with the first or index fingers, then the keys written with the second finger, etc., each as a vertical section. Thus it is possible to vary the time used in presenting the keyboard by teaching a finger section a week and so cover the entire keyboard in four weeks, or teach a section a day and cover it in four recitations. The plan would also adapt itself well to the whole method idea because of its finger key emphasis, the entire keyboard being taught at once. The strong features that have popularized this plan are (1) the student learns easily to associate certain letters with certain fingers, simplifying the matter of correct fingering, and (2) by beginning at the center and working outward, the first fingers, which are easiest to control, are used first, leaving the weaker fingers the task at first of holding the home position. This is a most encouraging, as well as a fast, plan of keyboard learning. The strongest and most usable fingers do the work at first, while the weak, ill-controlled fingers are developing strength and control by merely keeping the hands in base position.

The "skip about" plan is a combination of these two plans just described. It is based on the idea that the keys easiest to control should be presented first, so most of the first writing takes place near the center of the keyboard. This means that the easiest reaches and the

most usable fingers are taught first, leaving the weaker fingers and difficult reaches till later when more confidence has been gained by the student. The home row is taught, but with limited writing use of its keys, in some books. This plan necessitates a skipping about the keyboard to select the keys to be taught. In books stressing word practice only, the keys may be taught as they are needed in order to write the words to be taught. Since the keys are chosen as each author desires, each book presents a different learning sequence.

In contrast to the part method is the whole method, which presents the entire keyboard in one or two class periods. Every means possible must be used to stress correct fingering: different colors for each finger section on the keyboard chart, illustrations of the hands, with the letters written by each finger printed upon them, and numbering the fingers with the numbers used in the finger sections of the chart. Yet the whole method presents difficulties, chief of which are that key watching is encouraged, and uncertainty makes for lack of smoothness and ease of operation. Many believe this to be the fastest method of learning the keyboard, while others insist it does not shorten the keyboard learning time but encourages confusion, groping, and often sight writing. Mature students are more apt to find learning by this method easier.

Some typists never really learn the keyboard and are always uncertain of the infrequent letters and characters, therefore, it is wise to give some keyboard drill even in the advanced classes. A very brief, intensive review of the keyboard section of the textbook makes excellent drill or practice work for the advanced class at the beginning of the fall semester, even though it may take time.

Motivation for the Beginner. Training in typing skill is made up of a host of little things repeated day after day until they have been perfected. This procedure can easily become monotonous, and when monotony begins, learning is apt to end. Expert teaching will devise ways to hold interest during this necessary repetition work. Every possible method should be resorted to so that repetition practice may be done with as little monotony as possible. Repetition may be tiresome, but with the proper motivation it may be satisfying and will do its part in making motion patterns skillful.

Motivation is stimulation—the process of developing a situation of sufficient interest and immediate usefulness to the student to cause him to recognize the desirability of solving his difficulty. With proper stimulation, students may achieve astonishing results, and this may

prove to be a strong incentive to try more difficult tasks. If a student is not interested, he not only learns very little but also tends to become a disciplinary problem. Therefore, the typing teacher must understand the importance of adequate stimulation and know at least some of the methods by which effective motivation may be secured. With the initial interest that students have at the beginning in typing, they should do their best for a while. If the teacher teaches the student how to practice and sees to it that he knows what to practice, the student will be eager to work. Training students how to practice and what to practice is one of the arts in teaching typewriting. The skilled teacher will always be seeking new methods and new ideas to dress up the old ways of doing things. One of the most hopeless failures, as a teacher of typing, is the teacher without originality, initiative, or ambition.

Various methods of motivation have been used by teachers, some of which seem not to be especially effective. Some of them place a negative emphasis on progress and so encourage concentration in the wrong direction. The successful teacher will stress the positive and encourage the student to look up and forward rather than pay the penalty for what *has* been. The following are the methods of motivation most commonly used:

1. Grades, or marks—trying to interest students in getting better marks or threatening them with failure.
2. The honor system—using prizes, awards, or an honor roll.
3. The penalty system—keeping students after school, requiring rewriting of work, or requiring extra work.
4. Nagging, scolding, sarcasm, ridicule, or the disgracing of students before the class.
5. Making reports to the principal or parents when students are not making progress.

Since the work begins with emphasis on technique, the wise teacher will remember that habits such as walking and talking were awkward and inaccurate attempts at first and only gradually acquired the grace of later years. Likewise, in typewriting, students require time to refine their movements. The teacher's problem is to make them feel that if there is a smoother and easier performance on Friday than there was on Monday, something has been accomplished. Psychologists say that knowledge of success is a vital factor in producing learning and is more effective than knowledge of failure.

The problem of maintaining interest is largely an individual one—

all students do not enjoy the same things, all do not accomplish the same amount, all are not affected by the same appeals, and all are not endowed with the same abilities. Teachers could not turn out a standardized product if they wished to. Standardization is very necessary to modern industry, but is fatal to a liberal and progressive education that aims to develop each child into a distinct personality according to his own capacities and native gifts and at the same time fit this unique personality to assume responsibilities in the social order. Early recognition of how each student responds to encouragement, praise, and other forms of commendation will assist in determining the best method of guidance. Look for something to praise in the work of each student, especially the poorest who need constant encouragement. It requires no stretch of the imagination, even though there are shadows following some letters, to say to a student, "That's a much better stroke than you were using yesterday. Keep trying." Most students respond to such praise and almost enjoy the hard work it brings. Deserved praise judiciously sprinkled in with constructive criticism is one of the best ways of keeping students interested and happy. Although the use of praise is primarily a matter for individuals, frequently it can be used for the class as a whole to instill group consciousness and social mindedness.

After all, motivation is largely up to the individual. He must learn to type by actually typing. The teacher cannot do it for him. He can lead his students into new learning experiences as each student is ready for them, for the competent teacher knows how to direct the learning efforts of each student according to his needs. This leadership is based on a complete understanding of each learning problem, a keen sympathy for the individual student, and professional capability in deciding what to do and how to do it.

Psychologists, in speaking of skill learning, maintain that learning occurs only when the learner is exerting a distinct effort to improve. When the learner's attention is no longer needed to control a process, there is a tendency for the learner's attention to wander. The teacher must provide the type of practice that will challenge the student to improve. Teachers should be quickly aware of obvious "overeffort" on the part of the student. When a student tries too hard, it is fairly safe to assume that he is worrying over the progress he is making. This is undesirable and can be avoided if the teacher regulates the intensity of the effort that the student makes. It is safe to say that more students

work too hard at typing than students who do not try hard enough. This 'overeffort' destroys ease of operation.

In every class there are students who will provide their own motivation, and only relatively few who will need a great deal of stimulation. The personal, friendly interest of the teacher can do more than any of the known devices. It is usually the teacher with the weak personality who must resort to the various devices. During the beginning phases of the learning, discouragement may come when the student finds the going much harder than he anticipated. The teacher must see this coming and be prepared to meet it before it reaches a serious stage. Keep him believing in himself and his ability to learn. Make him feel that others have mastered the same difficulties. In the more advanced stages, it is the development of speed and accuracy that needs his motivating influence.

Directed Versus Individual Practice Through the sense of sight, strongly reinforced by impressions gained through the sense of hearing, students get a vivid impression of what they are to do. This means that the beginning student must be taught how to practice by directed drill. The teacher should conduct much of the drill at first by typing with the students, observing, mainly through the ear, whether they imitate the demonstration correctly. Slow stroking students can be heard lagging behind the majority of the class. A relatively high stroking speed is required in order to force the use of correct finger motion. Positive, clipped dictation by the teacher can do much to give the idea of snappy stroking and at the same time emphasize evenness of stroke.

The voice of the teacher will have a psychological effect on the student, especially when conducting drill work. By a studied control of his voice, he can make students write almost as he chooses. For example, if the dictation is labored and pronounced, the student will write slowly and sluggishly, with a heavy stroke that will fatigue him. If there is a lilt to the dictation, there will be an up stroke influence that will encourage faster stroking because of a lighter touch. The voice should be kept even, quick, yet decisive, so that the student will be encouraged to write evenly, rapidly, and with assurance. The teacher must also learn how to make his voice carry above the noise of the machines. This is accomplished largely by the pitch of the voice. A low pitch will carry farther than a high pitch and is more pleasing. A high pitch is thin, and does not carry well. A nasal tone, a high

pitch, or mumbled enunciation may irritate the students to inaccurate writing or bad conduct. A clear, inspiring, optimistic speech will serve as an excellent motivation device. The voice of the typing teacher may be pleasing or it may be monotonous. It may stimulate the student to his best efforts, or, if nagging and faultfinding, discourage him. It may influence him to write faster or slower, or it may make him so nervous that he will be more inaccurate. A recording of the speaking voice may reveal some of these defects.

Because of individual differences, a class of typing students should be taught how to practice as soon as possible. After that, most of the unison class drill can be eliminated. This will encourage students to set their own pace, which should continue to increase as the operation becomes easier. The sooner a student learns how to practice for himself, the faster his skill will develop. The job remaining for the teacher is to guide him in the selection of what to practice and to help him interpret his results. Too much emphasis cannot be placed on proper direction of attention and effort if improvement is to be made as the result of the practice, for improvement will not follow automatically upon mere practice. Train the student early to know how to choose practice material from the textbook, for the text contains a great deal of material that is better suited to practice than graded copies or assignments.

Early in the course the class period should begin with some kind of warming up drill to limber the fingers and get the student in the mood for the day's work. Since experts find such drills helpful, it follows that amateurs should find value in them. At first, these may be quite simple, like the stroking drill. Later, they may consist of a home row drill, like *a,sldkfjghfjdksla,sldkfjghfjdksla* etc. This drill, called the Expert's Rhythm Drill, will make the fingers work faster and may give the student the feel of rapid stroking. The warm up drill should not be continued too long—five to ten lines usually. It should be followed by something easy or perhaps some review practice, then by word or sentence practice, and, when time allows by some paragraph practice or later practice tests of $\frac{1}{2}$, 1, or 2 minutes. Practice booklets may be used if they fit well into the plan of the textbook, but their use is more adaptable to the other semesters of the course.

Many teachers use very little, if any, assignment or form work during the first semester. Some teachers use a practice basis during the key board learning and then require handed in exercises as the form work is taught. If the best efforts of the student can be obtained, it is a good

plan to consider the keyboard exercises as practice material, for that is really what they are. Occasionally, a practice paper may be handed in during this keyboard work. This paper should not be graded, nor its errors checked, but it should give the teacher an estimate of the student's work and an over all inspection can do this. Students are prone to think the teacher has no means of evaluating their efforts unless work is being handed in. This is unfortunate. Whenever the students cease giving their best efforts, the stimulus of handed in work may be used.

Unison class drill may be used just long enough to teach the student even stroking and the ease of operation that it gives, then he should be taught how to practice at his own rate, being urged always to push up that rate as fast as is consistent with accurate, technically correct operation. He must learn that accurate operation does not necessarily mean perfect work. If the stroking becomes uneven and spasmodic, a little unison drill will do no harm. The teacher should do everything possible to keep the student interested in his practice, for without interest in it and the application of his best efforts, there will be little skill improvement.

It is a matter of common observation that typists working at rates above 50 words a minute show definite technique superiority over slower typists. Then why permit or force the student to work at lower levels any longer than he has to? Is it because so many teachers have not yet understood the import of the efficiency engineers' axioms, "Slow motions are entirely different from fast motions", and "The control of slow motions," which spells slow, accurate typing, "is entirely different from the control of fast motions," which spells fast, accurate typing? Unison class drill may force part of the class to faster writing but this can be only a small part. For the rest, it provides no spur, and the best students will be working at a great disadvantage. What is the good of accurate typing at 10, 20, or 30 words per minute when the same material can be typed accurately at 50 words per minute by another student who has had no more practice? The slower student will be using a poorer technique as a result of the admonitions of the teacher to write slowly and accurately, a technique that will quickly become a maze of fixed habits that neither he nor the instruction can alter.

Planning the Work. A specific plan is essential for each class hour if the teaching is to be efficient and successful. The personal satisfac-

tion that comes to the teacher from the success that a good plan gives, as well as the value to the student, is worth all the time and effort spent in the selection and organization of the material to be taught and in the preparation for its presentation. In any complex activity, one is apt to handle the work better if one plans it in advance. Hence, if the teacher plans the lesson in advance, the results of his teaching will be more effective than they would be if he taught without any plan. Poor planning or lack of it makes for uncertainty, and skillful instruction cannot come from uncertainty. Neither is it recommended that a teacher make up a set of plans when first teaching the course and use the same plans time after time or year after year. Such plans should be remade each time they are used, to revitalize them. For the beginning teacher, the lesson plan is a necessity, and for the experienced teacher, it is advisable.

What is a lesson plan? It is an outline of what is to be taught, how it is to be taught, and what is needed to teach it. It should not be too detailed or too involved, either of which characteristics would make it difficult to follow. There is really no standard form to be followed. Keep the plan clear, condensed, explicit, and in outline, not essay, form. An objective need not be set up for each day or lesson, although a goal of attainment is a good thing. This goal may be something to accomplish over a period of several recitations. Every lesson plan should be flexible, so that it may be changed quickly should the need arise.

Lesson planning helps the teacher to cover material consistently and thus assure the completion of the entire course. It will make sure that the essentials are taught. Should a substitute teacher be necessary, the plan will provide a pattern for him to follow that will make his work more effective.

Teaching the Handicapped Student. Teaching typing to the physically handicapped student is not essentially new. For years students have been taught to typewrite with one hand. Most of these students had never had the use of both hands or had completely adjusted the one hand to all of their needs, and so could not possibly realize the need for the other hand. These were really not handicapped.

It has become increasingly necessary to teach students who are really physically handicapped to type. The machine age, infantile paralysis epidemics, and the casualties of war make it necessary that teachers of typing be prepared to train students with missing or useless fingers or who have only one hand. Such students are definitely handi-

capped. They have been accustomed to distribute the work load between two hands and must now learn to make one hand meet all their needs. These students should be given the opportunity to develop a skill of written expression that will be superior to their handwriting possibilities or that may enable them to find a place in society in a more gainful occupation.

Before the student can make the adjustment to his handicap, the mental hazard that has been set up must be overcome by convincing him that typing can be successfully done by either hand. Encouragement must be the keynote of any effort to teach a handicapped person a skill subject. He must be made to feel successful from the beginning. He must have patience, self confidence, and willingness to work. He should start under conditions as ideal as possible—in fact, the stage should be set so that frustration and disappointment may be absent.

The teaching problem will be highly individualized because the body capacities of each person will be different. Experimentation and ingenuity will be needed by the teacher to handle this problem intelligently. The major objective is to provide the handicapped person with a keyboard approach that will, in the shortest possible time, develop the skills and techniques necessary for that person to learn to type as rapidly as he is physically and mentally able. The degree of success attained by the student will depend largely upon the careful planning initiative, and understanding of the problem by the teacher. The success of teaching may depend upon making the best possible use of whatever fingers the person has. A complete analysis should be made of the physical assets of the incapacitated hand. No able member of either hand or arm, if it is at all possible to assign a definite manipulative part of work to it, should be disregarded. Quite often students who have lost the same fingers need different divisions of the keyboard because the remaining fingers have a different amount of strength or a reach of varying length. Individual differences in hand structure must be considered. Handicapped students need a great deal of help and supervision from the teacher. For this reason it is best to assign them to small class groups. They will be more easily discouraged in a large class. They may be self-conscious. If so, they should be given the least conspicuous location in the classroom.

Any standard textbook may be used in teaching the handicapped student, although changes in the material may be necessary as the work proceeds. The position at the machine is basically the same as for

the regular student, but the chair should be placed to the right or left of the machine, depending on the hand used. The usual position in front of the machine results in too much muscular strain, hinders the reaches, and crowds the upper arm against the body. Some operators find that greater freedom of motion can be obtained by turning the machine at a slight angle to the body. The right handed typist should have a machine with a right carriage throw, if possible. If it is not possible, then a long, low carriage lever will help to shorten the reach across the machine. The copy should be placed on his left. The left handed typist should use a left throw carriage and place the copy on his right.

As for the paper insertion, each individual will handle it in his own way, and his solution may be more practical than the teachers. By using a higher paper table, the paper can be kept in position against the feed rolls until it can be twirled into the machine. Using the shift key is a problem for the one handed typist. An incapacitated hand can be used to shift. If the hand that is lost was taken off at the wrist, the arm stub may be used to push down the shift key or to return the carriage. Of course, the shift can be locked each time, but this reduces the speed of operation. Another plan is to attach a string tied in a loop to the shift key with the toe of the shoe through the other end of the loop. With the foot balanced on the heel the shift can be operated by lowering the toe. In extreme cases the space bar may be operated in the same manner by the other foot. Clearing the tabulator is another problem, except where a lever will clear the entire rack. The arm stub or an artificial hand may be used to hold the clearance key while the other hand draws the carriage across.

The standard keyboard is poorly adapted to the use of one hand. If the operator has his own machine and expects to do all his work on it, a few changes in letter arrangement that will undoubtedly simplify the operation of the machine can be made with little difficulty. It makes the letters much more accessible to utilize the upper row for letters and put the less frequently used numerals at the sides where longer reaches must be made. If the typist has previously used a machine and knows the keyboard the hand should be kept in its home position and the rest of the keyboard operated with the first finger. If he has never used a machine it would be wiser to place the hand in or near the center of the keyboard. Since more work is done on the left side of the keyboard because of the predominance of frequent letters there

LEFT HAND ONLY

Home Keys
D F H JGuide Key
S
^{*}q ³w ²e ¹r ¹t ¹y ¹u ¹i ¹o ^{*}p
 a s ¹d ¹f ¹g ¹h ¹j ¹k l ;
 z x c v b n m , . /

^{*}q ³w ²e ¹r ¹t ¹y ¹u ¹i ¹o ^{*}p
 a ¹s ¹d f g h j k l ,
 z x c v b n m , . /

RIGHT HAND ONLY

Home Keys
F G J KGuide Key
K
¹q ²w ³e ¹r ²t ³y ¹u ²i ³o ^{*}p
 a s d ¹f ²g ³h ¹j ²k l ,
 z x c v b n m , . /

¹q ²w ³e ¹r ²t ³y ¹u ²i ³o ^{*}p
 a s d f g h j ¹k l ,
 z x c v b n m , . /

the right handed operator would seem to have a slight advantage in learning. Therefore, some advocate placing the left hand off center one key for its base position. It is not possible for the one handed typist to maintain the base position like the normal typist, and therefore some teachers advocate the emphasis of a guide key only, as *s* or *d* for the left hand and *j* or *k* for the right hand. Some suggest a vacant key between each base key. If this is not done, a more relaxed base key position results and the arm may be held in a more normal position without

First Finger Left Hand Off

^{*}q ³w ²e ¹r ¹t ¹y ²u ³i ^{*}o ^{*}p
 a s d f g h j k l ,
 z x c v b n m , . /

Second Finger Left Hand Off

^{*}q ³w ²e ¹r ¹t ¹y ²u ³i ^{*}o ^{*}p
 a s d f g h j k l ,
 z x c v b n m , . /

Third Finger Left Hand Off

^{*}q ²w ¹e ¹r ¹t ¹y ²u ³i ^{*}o ^{*}p
 a s d f g h j k l ,
 z x c v b n m , . /

Fourth Finger Left Hand Off

^{*}q ²w ¹e ¹r ¹t ¹y ²u ³i ^{*}o ^{*}p
 a s d f g h j k l ,
 z x c v b n m , . /

First Finger Right Hand Off

^{*}q ³w ²e ¹r ¹t ¹y ²u ³i ^{*}o ^{*}p
 a s d f g h j k l ,
 z x c v b n m , . /
First & Second Fingers
Right Hand Off
^{*}q ³w ²e ¹r ¹t ¹y ²u ³i ^{*}o ^{*}p
 a s d f g h j k l ,
 z x c v b n m , . /

raising the elbow quite so high. The fingers with the widest spread and the longest reach should carry the greatest load of work. The accompanying plans show how some of these fingering suggestions work out.

Oftentimes the handicap consists of one or more fingers off or incapacitated. In these cases shifts in the finger sections must be made. This should not be so difficult if the length and strength of the fingers are considered. It is not possible here to show all such arrangements but enough are given to furnish a clue to any needed plan.

CLASS DISCUSSION QUESTIONS

- 1 Distinguish, by examples, between the four learning stages of typewriting. How does the learning procedure differ in these four learning stages?
- 2 Distinguish, by examples, between skill learning and knowledge learning.
- 3 Why should only those machine parts used at the beginning be taught in the first lesson rather than all the machine parts?
- 4 How many letter spaces to an inch on pica type machines? How many to an inch on elite type machines?
- 5 Why is it important that the student do some typing the first day?
- 6 What is the most important function of the home or base keys?
- 7 Discuss left and right handedness as these characteristics apply to the typist.
- 8 How can the correct key stroke best be described?
- 9 List and evaluate the films available for teaching typewriting.
- 10 Why are the first class periods in typewriting crucial?
- 11 What are the advantages of demonstrating the correct procedure for the various techniques?
- 12 Why is it important that students always understand the reasons for a given technique or procedure?
- 13 Why is periodic review essential in skill development?
- 14 May students learn a skill without the teacher's aid because of their great interest in the task? How does lack of interest increase disciplinary problems?
- 15 List the methods of stimulation commonly used by teachers. Evaluate the effectiveness of each, and tell which may appeal to most students and which to only a few.
- 16 How would you prove to your students the futility of removing a sheet of paper each time they make an error and making a new start?
- 17 What purposes are served by making a written plan for each lesson?
- 18 Why is the problem of providing adequately for individual differences in typewriting ability important at the beginning?
- 19 Why is the practice of allowing gifted students to go ahead to the next

- lesson or requiring them to make additional copies of the same exercise not effective?
20. What are the disadvantages of having the superior students continually check papers or do other clerical work for the teacher?
 21. How important is mental attitude to the learning of the physically handicapped student?
 22. Give arguments for and against the usual plan of providing the typewriting texts free to students
 23. In which respect do typewriting textbooks differ most in content material or in the method of presenting the work?
 24. Approximately what points should be used to make a thorough evaluation of a new typewriting text being considered for use?
 25. Who, in the usual school, is best qualified to select the text? For how many years should a typing text be adopted?
 26. Explain the fact that many 40 word-per-minute typists cannot increase their speed because they have not yet gained a complete and positive knowledge of the keyboard
 27. If there is no such thing as perfect rhythm, then how nearly perfect shall teachers expect the rhythm of students to be?
 28. If students are taught locations and reaches by looking at the keys, how long should the process be continued for any single reach?
 29. What are the psychological reasons behind the statement "A good or a bad typist may be made at the beginning"? What are the pedagogical reasons for the same statement?
 30. It is said that teachers should guard against too rapid learning in the beginning work in typing. Why? What might result?

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CHAPTER IX

The Development of Basic Skill

The Teaching Problem In achieving typing skill, the student must assume the responsibility for his own progress. This does not lessen the importance of the work of the teacher. Rather, it broadens the scope of his task by requiring an understanding of the necessary student attitudes as well as skill development procedures. The teacher can direct, stimulate, encourage, challenge, and study his students. The student must work, follow directions, believe in himself, welcome criticism, willingly take suggestions, and possess the right physical and mental make up for skill. Learning to type should be a pleasant experience for most students, but too often it becomes unpleasant.

The Cycle of Skill Emphasis for Typewriting At first, instruction in touch typewriting had but one point of emphasis—learning to use the typewriter. It set up no restrictions on technique, material or accomplishment. The student developed his own technique, practiced or wrote any material he chose, and was satisfied if he developed sufficient skill to meet his own needs. Later, forms for doing various kinds of work were developed, resulting in an emphasis on accuracy that persisted for years. Next came the desire for speed. As speed is known today, however, the early emphasis was a feeble effort, due in part, to (1) the lack of knowledge of the importance of technique, and (2) the belief that accuracy must be acquired before speed can be developed. By comparison with the achievements of the athlete came the realization that technique was essential to correct operation of the typewriter. While the first efforts to apply this principle were poor, a better understanding of psychology and its application to typing brought the con-

clusion that technique must be emphasized before bad habits can be formed.

Unfortunately, some teachers insisted that "letter-perfect" copy be produced from the first day and then wondered why speed tests later were inaccurate. These teachers did not realize that correct techniques were being disregarded in order to obtain "letter-perfect" copy and that habits of slow writing were established. Finally, teachers came to believe that it was possible to build appropriately high stroking speed before setting up specific demands for accuracy. This rapid stroking is now developed from the beginning, and in the early learning experience errors of copy are of secondary importance. Harold H. Smith proves this by his statement: "A typist can no more acquire fast motions by practicing slow ones than an athlete can learn to run by walking." So it is now known that the way in which the beginner prepares the copy is far more important than is the accuracy of the finished product. Jay W. Miller says on this point: "If the pupil is doing his best, mentally and manually, the results as shown in copy turned out is really unimportant, for it is the quality of his *effort* that counts here (meaning at the beginning); not the quality of his *product*."

The best authorities agree that the teaching emphasis should never be relaxed so far as correct techniques are concerned, and coupled with this should be a balanced emphasis on speed of stroking and accuracy of writing and procedure. It is this latter emphasis that is the most difficult for teachers to apply because it is an art to know when to play up speed and when to stress accuracy. This balanced emphasis of speed and accuracy must be thoroughly understood by the student as well as the teacher, else the efforts of both may be wasted. D. D. Lessenberry gives this suggestion:

The typist should not push himself to his speed limit when typing material that is to be checked for errors. He should push himself for all he is worth when he is practicing for the specific goal of increased stroking and when he is willing to sacrifice accuracy for speed.

Any attempt to develop either speed or accuracy independent of the other is the result of confusion in thinking, for both are the products of two things—the right techniques and controls. The findings of O'Rourke showed that there is no positive correlation between slow writing and accuracy, for of 125 slow workers, only 25 per cent were accurate; but of 125 fast workers, 80 per cent were accurate.

The war training programs for World War II found this newer plan of emphasis workable. Thus, it is now generally recognized that speed and accuracy must be developed simultaneously, with the student taught the techniques for swift action from the very beginning of his learning. So unimportant is accuracy of output in the beginning of typing that the student's first attempts may even be destroyed without consideration, for it is control and the right attitude toward skill development that are being aimed at, and not production of copy.

The cycle of emphasis for the maintenance of correct techniques for typing can be effectively presented through daily practice or drill. Improvement comes through the right kind of practice, and not so much through quantity of practice. Emphasis on the maintenance of correct techniques is not a time consuming activity. A well organized plan of classroom procedure can be effective in giving needed attention to the whole range of fundamental techniques.

Text Materials and Skill Development Prior to 1910, all textbooks hurried from the keyboard lessons into practical form work. The student hesitantly worked through the keyboard exercises only to meet the most hesitant job of all—the setting up of practical business forms. He was thus forced to develop the habit of hesitation, of jerky stroking, before having a chance to develop a dependable habit of fluent, rapid, and accurate typing on continuous matter. The result was to bar him forever, perhaps, from high speed, accuracy, and fluency simply because he could not force himself over the bad habits acquired.

While the attainment of the three levels of fundamental skill was a progressive procedure in the old textbooks, the modern texts so integrate them that the third level, continuous typing, becomes the immediate aim at the outset of the course. The keyboard is treated only incidentally to the learning of the movements needed for its control and only enough of the most frequent words are offered as combination practice units to enable the learner to enter upon the development of continuous typing ability at an optimum level of skill.

What Must Be Taught There are two principal objectives or divisions in any typewriting course: (1) fundamental skill development, and (2) practical applications of that skill. Prior to 1910 the common objectives were, in the order of their teaching emphasis: (1) keyboard, (2) practical applications, and (3) skill development, if any. Today, the usual arrangement in textbooks written by authors who have been

able to shake off the shackles of tradition is (1) keyboard, (2) skill development, and (3) practical applications

In each of these two major divisions—fundamental skill development and practical application of skill—it will be necessary to distribute the material into three subdivisions (1) knowledge, (2) attitudes, and (3) skills Skill is undoubtedly the most important element in the two major divisions, but in “skill development” it relates to fundamentals—to the mastery of

- 1 Single character and space making movements
- 2 Execution of frequent character combinations, including short words
- 3 Execution of other frequent words
- 4 Writing of continuous (sentence) matter
- 5 Recording of thought on the typewriter

In “practical applications,” skill is more complex and less a matter of pure manual dexterity. It requires a close coordination of many mental skills with the skills learned in the first division of the course. Knowledge may relate directly to the skill that is to be acquired or become a part of that skill. It is then acquired by the student through the teacher’s giving basic information. Another kind of knowledge results from the teacher’s giving what is known as related information. Such knowledge, for instance, as that concerning the care of the typewriter, or how to look up information, is an asset to the typist, although he may not receive any direct remuneration for it. Attitudes and ideals have been well presented in many texts. They are necessary adjuncts to the success of the typist, *especially the vocational student*, for they enable him to achieve harmony with his co-workers and the public. There are, however, many special attitudes having to do with the requirement of simple and complex skills that should be systematically considered and cultivated.

The student must base his attitudes and his skill on right ideals and be able to utilize his skill and knowledge with an abundance of power and judgment. But the principal element of the whole course must continue to be *skill*—basic skill and its practical applications to more complex skills. The teacher’s job is to help him acquire these things most efficiently for immediate success on the first job and ultimate success in life.

The Influence of Terminology. The inadequacy of words to explain how performing a muscular skill feels “from the inside” is apparent.

This applies directly to typing, where even the teacher who possesses personal skill finds difficulty in describing elementary kinaesthetic impressions to his students. How much worse, then, for the teacher who has little skill and no kinaesthetic impressions to describe! Many skills suffer from the lack of a ready made terminology. While words may describe things seen, and with somewhat less facility things heard, yet the necessary words to clothe the muscular experiences are entirely inadequate. Even the experts do not know the true sources and development of their complex skills, although they have had a "rich muscular experience" that they find difficult to describe in words.

The Characteristics of Skill Mastery of the skill of typing depends on the way the student engages in the activity under the direction of the teacher, but what characterizes it? Most authorities agree that speed, accuracy, and fluency constitute the answer and that to obtain any one of these at the expense of any other one is shortsighted indeed. Many things contribute to the development of these three characteristics, two of which will be found in every list—correct techniques and control (both mental and manual). Technique—the set of habits that constitutes the operational part of typing involves automatic performance of the letter strokes, singly and in sequence, copy getting and manipulation of the machine. Technique begins as a highly conscious process but finally becomes completely automatic in the expert stage. Control is the voluntary guidance of the performance and involves an attitude of mind characterized by calmness and a realization of competence—a will to rapid accurate performance. It is developed by well directed practice, based on scientifically planned material.

There are three successive levels of basic skill: (1) the isolated character making level, (2) combination production and (3) continuous typing level. Armed with a mastery of the practice technique needed to develop these levels, the student can make an expert of himself if he tries. The third level should blend into sustained typing skill which is skill capable of being maintained in a steady fashion without much, if any, variation. It is the goal of fundamental typing skill.

The teacher is in a position to increase the pace of the student's acquirement of the three levels of basic skill for many methods may be used. Their common purpose is to increase the student's motivation, his satisfaction with improvement, his dissatisfaction with a lack of improvement and to create situations in which certain specified objec-

tives, known to both teacher and learner, may be attained. The student should be led to study the nature of his progress from day to day, conscious of failure as well as of success, gradually building up a "will to improve" based on an intelligent interest in his progress and an accurate knowledge of the true nature of this progress.

The Technique Emphasis. The initial teaching of the correct techniques is not enough, there must be recurring emphasis throughout the entire learning period. Even at the expense of textbook assignment requirements, there must be organized teaching for the maintenance and the improvement of techniques for advanced students as well as beginners. Organized teaching is best done through a definite series of emphasis in which one technique is brought into the focal point of attention each day.

The identification of the techniques that need this recurring emphasis is not difficult. A study of expert typists reveals that only a few skills must be brought to a high performance level, and these can be taught. It is the intent of every teacher of beginning typing to teach the techniques that will lead to expert performance. However, somewhere between the early lessons and the typing of the weekly budget, something goes wrong and only a few become experts, too few even become vocationally competent.

There is no longer any need to doubt that higher speeds can now be developed in less time. Many teachers demonstrated this under the speed up war program. Nor does the development of fast stroking imply the necessity for giving up the requirement of reasonable control. On the contrary, real speed must be built through the use of correct techniques, and these inevitably lead to the development of speed and accuracy. The tense, hurried, spasmodic typing of the student who must meet a speed goal without first having been required to meet a technique standard is evidence of the failure to provide the cycle of emphasis that will reconstruct and maintain necessary typing techniques. It is not enough to teach once, there must be organized follow up work at stated intervals. Superior typists must be expert in certain techniques. D. D. Lessenberry describes these in an article, "The Cycle of Emphasis for Typewriting Techniques" (*Balance Sheet*, September, 1943). Teachers of skills must understand each thought, action, and important factor that constitutes good technique.

The Fluency Emphasis. For some time the word "fluency" has been used instead of "rhythm." Correctly understood, however, these words

mean the same thing. This is possibly because of the general misunderstanding of rhythm and its application to typing skill. Fluency embraces the idea of passing rhythmically from one rate to another. August Dvorak has defined fluency as "rhythm smoothly maintained," and Harold H. Smith has called it "an interweaving of rhythms." It applies equally to mental and muscular action. A skillful typist is more concerned that his physical movements shall be smooth than that the machine shall click rhythmically. His pace changes smoothly or fluently.

Psychologists long ago remarked that skill in any single operation is always improved more rapidly when the operation is combined with other operations in natural situations than when it is sought through practicing an isolated operation. This principle has motivated the modern trend to a quick coverage of the keyboard, reduced word practice, and the early introduction of sentence practice. Yet, no practical psychologist has ever suggested that the seeker after skill can omit completely all practice of individual operations as such. In the field of time and motion study, the late Dr. Frank Gilbreth found that the motions are the elements to be considered in learning to perform any activity" and that each motion must be taught at first separately in its proper order and then as soon as possible, in conjunction with the correct sequence of motions as they are to be combined in the complete operations, expertly performed.

Skillful typing depends on perfecting two related kinds of operations: (1) the simple motion for performing each single operation on the typewriter, and (2) the complex groupings of these single operations into motion patterns. Whether the stimulus to make these motions is seen, heard, or arises within the mind of the typist makes no difference. The skillful operation of the typewriter demands that the typist approach expertness in making both the separate motions and the motion patterns. Rhythm makes its appearance early in the development of any skill. It can be traced as a rhythm of sound in the old method of memorizing the home keys by pronouncing them. The combined rhythm of sound and of physical movement can be discovered in the natural tendency to practice even the earliest efforts in units of two, three, or four strokes, like *frf* or *juj*. The more nearly correct the learner's technique of striking the keys and performing other operations, the more nearly perfect will be his control or rhythmic tension, motion, and relaxation on each separate operation. Modern typing

texts have encouraged this tendency to learn and to act rhythmically by arranging some material for even stroking

In progressing to a higher rate of speed, steady rhythm must give way to fluency, or "an interweaving of rhythm." This has been proved experimentally. When the several operations in a series are necessarily confined to one hand, the intervals between successive spacing movements of the carriage are longer, even though the typist may not reduce the speed of his hand movements. If the motions are actually awkward, this extension of the interval between movements of the carriage is more marked and is accompanied by whatever reduction of speed is required to manipulate the difficult combinations safely and smoothly. Thus, the skillful typist changes his pace smoothly, the less skilled typist is more concerned with the rhythm of his physical movements than with the sound of the timed clicks of his machine, and the unhampered typist who is striving for greater skill does not aim solely for rhythm unless he has apparently reached expertness in the motions he makes, his upper limit of speed. With the rapidly progressing learner, the speed and accuracy of his motions remain his major aims, for he strives to improve his rhythm only to insure the easiest possible execution of work at each speed level as his skill increases. Such practice provides experience that is always useful when difficulties appear at higher speed levels. Then the typist must slow down in order to extricate himself without loss of control. If he has enjoyed considerable smooth, rhythmic practice on similar combinations at lower speed levels, he falls back on the habits that have been thus formed, to a large extent operating the machine automatically at reduced speed, while he devotes most of his attention to restoring control. He accomplishes this in a surprisingly brief interval and then swiftly resumes his best pace with correspondingly faster rhythms. The poor typist is either erratic, lacks all rhythm, or uses a too nearly metronomic rhythm at unnecessarily slow speed. In either event, when disturbances occur, he has no habits on which he can depend to tide him over the moments required to regain control. He must stop or make errors, or do both, and he can never become a skillful typist until he learns the true meaning of rhythm.

Without "right motions at best speeds," one cannot become a skillful typist. Every student deserves to be encouraged to develop fast, rhythmic motion patterns. He must be shown how to attack these patterns directly by demonstrating how they sound. Tapping one

stroke after another with evenly spaced intervals between them can never represent a pattern. The time pattern combines these evenly timed strokes into groups made up of letter sequences, syllables, or words (and in the advanced stages, phrases), followed by a relaxation interval that shortens as the skill develops and eventually blends into a flowing rhythm. Such grouping represents a pattern of motion that automatizes quickly with speed and accuracy inevitable. Skillful typing is not done on the isolated stroke level, but on the combination level. Too great straining for metronomic rhythm and too little understanding of the true nature of motion patterns have made a farce of practice on combinations. Students may type pages of practice on such letter sequences, but, if they never practice them on any but the isolated letter level because the teacher tries to enforce metronomic rhythm, they cannot hope to learn motion patterns for groups of strokes. They are practicing only a succession of single strokes.

If any operation is to be done skillfully, some measure of fluency or rhythm must enter into it. This applies to mental as well as manual operations. There must be a definite method, followed by much practice, to make the transmission of nervous and physical energy automatic. After that it is purely a matter of how much energy can be forced into the proper channels before their capacity for accurate and smooth control is reached. The secret is to strive continually for the one best way to execute each operation, to perfect it at low speed, and then gradually to increase the speed. Fluency and speed are usually better when typing is done on the combination (words and phrases) level and more poorly done when working on the lowest (isolated letter) level of skill.

Skillful typing is acquired only by striving to increase the pace by inventing new and faster motion patterns, yet without loss of accuracy. The degree of typing skill depends on the rhythmic qualities of each motion pattern and the ways in which the patterns are combined. The rhythmic or fluent typist has an advantage in that he passes from one operation to another smoothly, without starts and stops, without jerks, and with assurance. Fluency increases output because it makes any speed more continuous, and it makes accurate typing easier because every mental and manual effort is under surer control.

The Speed and Accuracy Emphasis There is a strong tendency for speed and accuracy to be emphasized together in all motor skills that have been experimentally investigated. This happens, however, only

when the whole learning process is intelligently directed. If one pushes for speed beyond one's control, accuracy will surely suffer; on the other hand, if one thinks of nothing but absolute accuracy as an end in itself, one's very anxiety becomes an obstacle. Speed and accuracy both flow from the same source—properly placed internal control and an organized flow of rhythmic effort. It is this that the typist must strive to establish. Because of the close relationship of these two—speed and accuracy—their emphasis will be treated together.

Every teacher of typing wants the final goal for the semester's work to be rapid and accurate typing. Students want to write rapidly, and their natural impulse is to type rapidly from the beginning even if inaccurate strokes are made. Speed of stroking should be established during the early lessons, while accuracy should be the final goal for the finished typist. The often quoted, but seldom tested, theory, "Get accuracy first and speed will take care of itself," has been revised to read, "Get speed and let accuracy come later as the result of good habits and the right controls."

Correct technique and rapid stroking should precede the emphasis on accuracy and precision. Deliberate typing is incorrect, because the student is concentrating on accuracy as he writes letter by letter. Deliberate typing also has a tendency to make the operator stiffen his muscles and hold the keys with a great amount of force, thus using excess energy and causing the keys to hang. This slow but sure manner is detrimental to speedy and dextrous typing. Such a method of typing never brings speed, and the operator who uses it gains only when he relaxes and daringly "lets himself go." At the same time the teacher must bear in mind that any mention of errors or accuracy on his part kills the proper beginning, which, when once lost, is difficult to regain. Thus, accuracy is subordinate to speed in the beginning. Of course, this does not mean that inaccuracy should be encouraged; but accuracy when thought of in terms of striking the correct keys, letter by letter, tends to produce deliberate typing and a rigidity of movement. Gestalt psychology is in accordance with this idea. Poky thought and action, fumbling, and hesitation must go. Accurate control of speedy motions must be established. Typing one stroke after another as a series of isolated efforts is just as unskillful as trying to read by spelling out the letters in each word. Somehow the student must learn how to type frequent, facile combinations of strokes as combinations; that is, words as words.

There are reasons for the overemphasis on accuracy (1) an unquestioning faith in the value of slow but sure repetition to develop speed, and (2) the assumption that a beginner's typed work should be 100 per cent perfect. In regard to the first reason, the Gilbreths proved that fast, correct stroking is not mastered in slow practice, because the paths of correct, fast motions are different from those of slow motions. This means that a student who has had accuracy stressed from the beginning will have to learn an entirely different type of motion when attempting to speed up his writing later.

There is, though, a definite relation between speed and accuracy, and thus accuracy cannot be entirely ignored in the development of speed. The problem of speed versus accuracy is not whether emphasis in typing instruction, especially during the first semester, should be on speed or on accuracy, but whether emphasis should be on correct motions (technique) or on the number of typographically correct lines or pages. It is true that during the first semester many teachers have made accuracy of typed pages the first goal, the number of typed pages the second goal, and the technique used the third goal, with the third goal ignored entirely sometimes. Dvorak claims that his investigations indicate conclusively that the acquisition of correct motions is outstandingly the first goal to be attained. Because correct motions are fast, smooth, and continuous, speed is a second goal in beginning typing. Accuracy of typescripts is decidedly the third goal. The highly satisfactory result from this rearrangement of emphasis on goals is that, if the technique is good, accuracy is inevitable at high speeds as well as at low speeds. In fact, the degree of accuracy that students attain is indicated by the degree of perfection in their technique. Typing speed grows if fast motions are present from the start.

While a student is learning the keyboard, he is working with an unfamiliar thing, and his action is apt to be excessive. Therefore, one of his learning problems is to get rid of this excess. Asking a student to recopy material for the sake of accuracy increases tension and makes matters worse. If the same error consistently occurs, it is profitable to take time out and practice the proper remedial drills to correct the error.

A formula to be followed in the acquisition of speed could be (1) Emphasize technique, consisting of efficient motions, correct operations, and correct posture (2) Develop fluency or fast motions (3) Emphasize accuracy, or precise motions.

The Introductory Training. The teacher's first procedure should be based on logic, with subject matter as the core, the second is based upon the certain knowledge that the student wants to operate the typewriter, and that he is already interested in acquiring at least some degree of skill. Although students are interested in developing typing skill, they seem to have no organized method of attacking the problem, hence the teacher becomes the important factor in the success or failure of the learning and the improvement that follows. The teacher sets the model, he helps them to adopt a method for their own individual improvement. From the outset, the teacher must secure the student's co-operation in all learning activities. This should not be difficult because students are motivated by eagerness to learn, but sometimes they are so enthusiastic that they seem to overlook the importance of the less obvious aspects of achieving skill.

The key to teaching this first knowledge type learning successfully is to create real situations that result in a recognition of learning needs in a natural way. The teacher can lead the way to the first short words that are to be typed by demonstrating how a few of the first short words can be typed skillfully as a preface to the student attempts. With this word practice, the teacher really begins to train for skill. He may direct some unison drill and suggest individual practice as he goes about the room helping those who are having difficulty.

Thus, the students are mastering their first hurdles. The teacher-coach is showing them how to take those hurdles, how to improve their motions from effort to effort. No time is being wasted in attaining the mastery level of skillful motions and thinking. Out of this training comes a greater thrill than that experienced by the expert. He realizes that his teacher has contributed from personal experience something he might never have learned by himself in years of less intelligent practice.

Now, the beginner is ready for simple one or two line sentence work. First, have him try to master each word in the sentence, typing the easy ones as a whole and the difficult ones letter by letter (there should be very few of these). Next, the words as they occur in the sentence should be practiced in twos, threes, and so on, and then each line as a whole, then, the two lines of the sentence. This will stress the need of a swifter carriage throw. The next step is to start on pressure practice— $\frac{1}{2}$ minute and 1 minute tests. Students may compete with themselves, with each other, or with the class as a group. As incorrect

technique is observed, they should be shown how to save time and energy. From ten to fifteen minutes may be spent near the end of each class period in this type of intensive training. During the first two weeks the teacher should have developed an efficient warm up routine, suggestions for which will be given later in this chapter. After the warm up and review practice, the above routine procedure may be effectively used.

Some part of these early class periods should be spent in learning how to control the mind, eyes, and fingers so as to produce an accurate typed result. This involves training the student to slow down his pace of typing without slowing down the speed of making the separate motions. No greater mistake can be made than merely assigning perfect work or other accuracy requirements on a given exercise. For the first fifteen or twenty class periods, the average student cannot sustain his concentration on accuracy as a goal beyond a line or two and these should be short lines at first. Telling typists to slow down is not always good training procedure. The good coach sets the right pace, if he wants a runner to slow down, or he gets another athlete to demonstrate it. The typing teacher can do the same thing by tapping a single key in the rhythm and at the rate the student has been practicing. He can then contrast that rate with the slower and more desirable rate, which he should demonstrate for the student who is having difficulty in getting control of his "speed and accuracy." The student can then continue his practice, following the sound of the teacher's demonstration. This insures sound teaching for it sets up immediate, understandable, and worth while goals.

An introductory course, like this just suggested is almost entirely a training course. The students should be anxious to exercise their eyes, fingers, and minds at the typewriter through most of each practice period. They should be creating satisfactions and sensing steady progress. Their fingers should be learning many new tricks each day. Such training requires an active, enthusiastic teacher who understands students and their individual differences. It requires a teacher who not only understands this training routine but who knows how to spend every class period in effective work with the students. It requires a teacher who can demonstrate what he teaches, because demonstration is less subject to misinterpretation than are directions.

The demonstration machine should be placed where the teacher's hands can be seen by every student, if possible. The teacher should

pronounce and type each combination or word several times at practically expert rate. He may call attention to the way his hands hover close to the keyboard, to their being relaxed on the home keys when not actually typing, but the principal impression he is trying to make is how the stroking sounds, and what the movements of the fingers look like for each combination. Then the teacher should have the class say-and type with him enough times to allow those who can master the drill in this way to do so. A pause should follow the combination at first, the length of which is important. The speed of calling and typing the combination itself need not be reduced materially, but the pause should be long enough to insure thorough relaxation, return of fingers to home keys, and time for separately directing each response until class unison has been attained. Then and then only may the pause be shortened without danger of affecting adversely the execution of the combination.

Four types of images are being used to fix the new habit: visual, vocal, auditory, and kinaesthetic images. They act and react upon each other, and, if one of them is weak, the others are likely to be. Having the class continuously call the combination and pause with the teacher while the movement is executed at the same time develops the kinaesthetic image. Control is obtained by properly regulating the length of the pause, gradually quickening the responses to allow a shorter pause. Near the end of the practice, only a brief pause is necessary—just enough to permit the relaxation-tension-relaxation cycle required for correct execution.

After the first few combinations have been taught, the teacher should find it possible to call and type new combinations two or three times and have the class join with him in the same operation. When the drill on any combination can be executed at the rate of four in two seconds, the class is ready as a whole to proceed to a new drill. The pause need not be called, but can be made in the rhythm of the count. After sufficient practice on this, there remains but one more step. It is now time to step up to the higher level and to perfect the mental controls whereby, when the eyes see, the ears hear, or the mind thinks any of the words previously practiced, the proper typing movements should be set off at best speed, with best accuracy, and best fluency. Many of the students should have arrived at this goal already, but many others of lower motivation and duller learning capacity will not, so the practice continues on the drill.

As with the teaching of combinations, it should be found, after a few words have been mastered, that these steps for working out each word will go much more rapidly, and the class should reach the higher levels of skill in a surprisingly short time. The teacher will then have taught the student "how to practice." This is something conspicuous by its absence in many typing rooms. Once accomplished, the teacher can cover a far greater mass of learning material with better results and more interest and enthusiasm on the part of the students. Progress is evident.

The speeded efforts on the combinations and words will not all have been 100 per cent accurate, for the students are striving to make new and faster movements. They are adapting themselves to definite objective standards set by the teacher. Once they reach the speed set, the teacher should reduce that speed slightly and strive for a higher degree of accuracy, pushing up the speed gradually until best speed with best accuracy is attained. Finally, he should reduce speed again and work with the class for 100 per cent fluency again, gradually increasing speed until the word can be executed with the best fluency. If students respond quickly by picking up skill on separate words, they will attack short phrases, such as *of the*, as though they were single words. It would be a waste of time to attack them separately.

Somewhere in every line, in either a short or a long word, a slow combination will be found. Concentrate practice on such combinations, emphasizing the necessity of lessening the speed of stroking and controlling it, especially when reviewing the line from the beginning. Soon every student in the class will be able to type that line as fast as the teacher, maybe faster. This sort of thing may be extended to a second line, but frequently students will find that they are unable to type the two lines as fast as the teacher or the better students in the class, even though they can equal them on each line separately. The reason may be their carriage return technique is poor: they may not reach for the line space lever promptly enough, they may be slow on the return, or they may not recover operating position properly. If it can be proved to the students that these faults are the cause for their lack of speed, a natural incentive to master the carriage return motion will result. Since it is a known fact that the beginner can manipulate the machine expertly from the outset, then there is really no excuse for permitting him to practice unskillful motions and to fix them as habits. When it is said that the beginner can manipulate the

machine "expertly," it is not meant that he can equal the expert in sustained typing. It means only that he can do so on very short spurts, represented by combinations of from two to five strokes, which include many short words. Essentially, it means that the student learns to make motions and responses with the facility, the accuracy, and the smoothness of the expert, not, of course, in sustained fashion, for common sense and experience teach that sustained performance in any skill, such as typing, demands the refinement of a multitude of mental and physical controls and processes that can be built up only after much well-directed practice.

The Basic Skill Routine In training a student in any skill subject, regular, systematic practice is a paramount necessity if fast, accurate operation is to be developed, and only a routine procedure can do this. Visible progress made from day to day is so small as to be even negligible sometimes, but if good habits are formed by daily repetition, if concentration throughout a given period is developed, if the student is aroused and stimulated to do his best each day, and if the teacher has infinite patience to drive encouragingly day after day with perfect control of the entire student group and has a live, vital enthusiasm in all that he does, it is certain that his students will be successful and perhaps above average at the end of each semester. The results obtained from week to week should be more evident than from day to day. The final results at the end of the semester will be gratifying both to teacher and to student.

One's skill cannot function with certainty at its peak unless every minute detail of thought and action has been systematized—many of them must be automatized. Teachers must stress the importance of a rich, but uniform practice routine. A good basic routine will usually consist of three different types of routine: (1) an assimilation routine, (2) a skill routine, and (3) a job training routine. These will be discussed briefly.

Assimilation Routine The assimilation routine is used where new ideas and information constitute the chief content of the work, and wherever new applications of typing must be explained or whenever information concerning planning and arrangement must be covered. It follows the generally accepted routine for knowledge-type learning, with emphasis upon application and as much drill as time permits.

Skill Routine The skill routine is gradually developed out of the assimilation routine of the early lessons in a text. Step by step, the

emphasis on new information about technique, what to practice, and how to practice is reduced until only an occasional reminder is offered. At the same time, increasing emphasis and time are devoted to drill and practice, shifting the interest and attention toward the acquisition of skill in performance. Finally, a complete basic skill routine should emerge. This routine should be varied so that it has a dominant aim for each lesson and should vary in the length of the practice efforts. Partly for the sake of shifting interest for better motivation, and partly because it is a necessary element in making rapid progress, the dominant aim of each lesson should be directed toward some one objective. A cycle of aims for each of the five days of the week is advisable.

The first day of the week may be devoted to improving accuracy, because the student has not typed for two days, and before he can safely drive toward higher speeds, he must thoroughly re-establish his attitudes and controls. Steady typing is the dominant aim for the next three days, during which the emphasis is laid on longer sustained efforts. Accuracy is the major factor for Tuesday's effort, and speed for Wednesday's. This third day is devoted to forcing speed, so short timed efforts predominate. Thursday should be devoted to sustaining the speed of the previous day with more emphasis on accuracy of performance. It is wise to work mainly for accuracy on the day before the weekly test, which falls on the last day of the week, for the obvious reason that this is the best time to measure the cumulative effect of the daily practice of the week. All practice should be done with a strong emphasis on accurate performance and results, yet, some effort should be made each day to force speed, and for this purpose short tests are best. Some effort should be made each day to sustain whatever phase of skill one has improved in the preliminary practice, and this is done through sustained efforts. Progress in sustaining any newly acquired skill is made through longer timed efforts than when forcing speed is the aim. This warrants the use of the 5-minute, 10 minute, and 15 minute tests as the training continues. Their use is a progressive procedure. The longer skill can be sustained, the more dependable it is. Varying the length of each effort contributes to learning progress. Students soon learn to adopt an alert, determined attitude when short copying efforts or half minute and minute tests are announced. This attitude is a prerequisite for improving any element of skill. Its absence accounts for much of the monotony and mediocrity in typing rooms. Anyone who has acquired a skill knows that only one of its elements

can be concentrated upon and improved at one time. He also knows that improvements are made on short, intensive efforts. It does not matter whether the objective is some point in posture, in finger or hand motion, in control of power or of fluency, or whether it is a matter of forcing for speed or holding back for accuracy—any and every phase of typing skill except the sustained phase is best attempted on brief efforts, which may be timed or untimed. Generally, efforts aimed at accuracy and fluency, at posture and technique, and at better methods of “getting copy” through eye or ear should not be timed. The moment some improvement is noted, the typing should pass from the experimental and drill stage into the practice stage. Here the aim is to fix the new learning into as dependable a habit form as possible. Proper timing provides an incentive that insures more intelligent and intensive practice.

In many cases, the first few timed efforts cause strain and nervous tension that destroy co-ordination. The cure is to shorten the number and length of the timed efforts until control is regained, then increase and lengthen them gradually until timing loses its terrors. No one is master of any skill until he can use it confidently, under pressure. Efforts without the element of timing pressure are always made on a relatively low level of energy expenditure. Such practice is always slower than the typist's best. It often results in more errors and contains hesitations and unnecessarily extended periods of total inactivity. Teachers are expected to eliminate such inefficiency from all forms of learning.

The intelligent use of timing for short and long periods, according to the needs of the students, is strongly indicated as the best method of maintaining drill and practice efforts on the highest possible plane. It is used freely in nearly every type of learning that involves skills. It has been proved and accepted in many classrooms, and for years it has been used in training every typist who became known as an expert.

Job Training Routine The job training routine is really a composite of the assimilation and skill types. When it is necessary to introduce the student to some new letter or business form, to give information about placement, the essential parts of the form, etc., he must first assimilate ideas that contribute to the knowledge phase of his learning. This is true whether the information provided is basic to an understanding of form and arrangement or whether it refers to minor details,

such as variations in form, how business papers are used, their relation-ship to each other, etc. The only difference is that these minor details usually involve small points that can be covered rapidly and that are best mastered through doing. Stressing the acquisition of knowledge with as much drill as time permits is the assimilation routine.

Knowing how is one thing, skill and dependability in doing are quite another. Hence there is a great need for practice, for training in doing these many things skillfully. This development of skill automatically carries with it a strong fixation of the knowledge of what is necessary, how it is to be done, and the creation of dependable attitudes toward the typing job. The skill routine must be employed in the phase of job training, with such adaptations as become evident with the increase in the amount of typing practice required on the project. Thus the whole course in typing becomes a correlated plan combining the three types of routine—assimilation, skill, and job training.

The Importance of Drill to Skill Development A typing drill is generally recognized to be an exercise which, if repeated sufficiently, will initiate, improve, and fix some particular skill in order to assure its functioning as a habit. To meet this skill building need, the authors of typing textbooks have supplied teachers with a generous variety of drill material organized around certain specific purposes. This means that typing drills are to be used with an understanding of their real purpose, in fact, each drill should be practiced with an understanding of what it is supposed to do in the development of real skill.

But, unfortunately, drill sometimes means aimless, unison typing that restricts students who can and probably should type at a much more rapid rate. The name has become a handicap, whether the drill is on meaningless letter groups, words, or sentences, because students think of a drill as daily punishment rather than as daily progress practice. Drill can be made an effective means of teaching, reconstructing, and improving techniques that will carry over into sustained skill and production typing later. Perhaps the use of a more action impelling word to describe the specific purpose of the practice may help students to overcome the tendency to regard daily drill as a waste of time and as productive of nothing except boredom. Lessenberry has suggested a series of terms. For example, he says, when the purpose of the drill is to develop accuracy, call it "typing for control." There are other descriptive terms, such as "conditioning practice," as in athletics, that can be used to denote the type of drill and the purpose of giving it.

Each teacher may select his own name for the practice or drill, but new terms or names may not of themselves be sufficiently action impelling.

The teacher should briefly explain and daily demonstrate the purpose of the practice and the way it should be done, for drill should never be purposeless and ineffective. If drill is to be effective, it must be directed toward a specific goal and it must make definite and measurable improvement in the work of the students. Drills can be used for specific and realizable purposes. For example, drill may be effective in developing quicker stroking, smoother typing, and greater certainty in the control of the keyboard. Again, drill may be used to quicken the carriage throw, to develop facility in shifting, and to set up a pattern of efficient machine operation that will add to the total skill. Thus, drill work *can* do these things and drill work *should* do them.

One can make a habit only of what one experiences—fix only what one practices. The problem of drill, then, is to select the particular element of technique that is to be held in the focus of attention and apply to it the recognized rules of skill building. The teacher should seek the best way, and then use every opportunity that affords itself to train students in the exact practice of that technique.

Drill must be rationalized—its purpose must be a convincing one—the student must be sold. The maintenance of right techniques for typing can be effectively presented through the daily drill, and it is up to the teacher to sell it to the students. There are many elements of the correct technique that, if kept in the focus of attention, will contribute materially to economy of movement and accuracy of stroking and give a clear picture of good form. If these elements are not stressed, the student will develop his own techniques through the trial-and-error method, and he will not become as fluent or efficient a typist as directed learning would have made him. Right techniques must be gained by isolating each technique, and, by precise practice or drill, *ease in doing it is gained*.

Teachers cannot talk to students about the improvement of their technique if they are constantly working against the deadline for the completion of a budget. Students will not take time off to build skill in stroking or control if they want to get in their budget. Drill can be interesting, fascinating, and much more pleasant than budget work if intelligently administered. Only tasks with a significance challenge one, so give the drill lesson a point. Make sure the students understand it, lead them sympathetically and enthusiastically as they explore it,

let them know frequently how well they are succeeding, and the drill work will be a time of serious and absorbing practice

Drill should be accompanied by appraisal Both teacher and student must be able to recognize, in objective form, the progress made as a result of their work This measuring device is essential in order that the practice may seem worth while, and that it be attended by a feeling of satisfaction It may be very informal—through individual help—or it may be a more formal measure No matter what form this measuring takes, it must be present The students must know where they are going, how they got there, and how fast they are traveling under the teacher's guidance

The athletic coach selects the athlete's equipment wisely and controls its use He knows that a properly constructed, carefully rolled, flat track is better for basic training in all running events than a cross-country course The progressive teacher of typing has long since discovered that simple, smooth running material, largely composed of the commonest words, is far superior to the ordinary material to be found in books Most ordinary paragraph material contains complex sentence structure and is usually peppered with a variety of relatively infrequent words, many of them long Short words are always easier to master than long words Various studies indicate that about two thirds of the words in ordinary paragraph material are to be found among the first thousand most frequently used words Since most of the short words in the language are included in the higher frequencies of the thousand commonest words, it naturally follows that matter containing upward of 20 per cent more practice on such words is superior practice matter Eighty-two of the thousand most frequent words contain all the 210 most frequent combinations of two to five letters each These frequent short words provide many illustrations of difficult combinations that may be typed only on a stroke by stroke basis Thus, a student practicing material rich in high frequency words has a better opportunity to learn how to type skillfully those frequently recurring words that require stroke by stroke execution than he would have were he typing ordinary practice material, with its constantly changing obstacles to skillful fingering

These same thousand commonest words provide examples of most of the different letter combinations whose natural facility permits the development of that higher kind of typing technique that dominates real typing skill—the ability to execute two or more strokes as a single

serial response Here again, if the typist meets these favorable combinations frequently in practice material that is rich in the thousand commonest word vocabulary he more quickly and surely masters these combination skills than he would were he to meet the same combinations hidden away in other words of lower frequency, many of them containing difficult combinations that slow down his execution It is clear that practice concentrated on the thousand commonest words will enable the typist to blend his skill in isolated stroking and in sequence stroking into the smooth fluency that is required for practical, skillful performance The perfection of this co ordination of the two basic types of skill rests similarly upon the relative and actual frequency of opportunity afforded to the typist for practicing each of these three skills intensively and effectively

The use of teaching devices, like oral dictation or spelling by student or teacher, should be used for learning the shorter combinations These devices should then be followed with a synthetic process of building complex skills upon simple ones It is only by blending the ability to make individual typing strokes with the ability to execute frequent sequences that typing can be done skillfully at all Practice on long words and phrases furnishes the natural approach to mastery of this blending process These two basic skills can be acquired only through taking the proper steps in the approach, followed by intelligent repetition, and their skillful blending can be perfected only through much repetition on continuous matter

The next stage in the development of fundamental skill is the production of continuous writing—straight away typing from copy in long hand, typing, or print This involves sentence practice and then paragraphs There are two possible approaches to sentence practice (1) the student types through the sentence once or twice to get acquainted with its "feel", and (2) the individual words in the sentence are taken up and treated as words to be drilled upon according to the best methods of word practice The second method is especially desirable as an approach to continuous typing through group drill—to teach the typist how to attack the problem as a whole and in its various parts The student should know how to pick out words and phrases that cause him difficulty He should know how to concentrate his intelligence and effort on them until he has mastered them He is then ready for paragraph practice and the more sustained effort required for the production of straight away copy

Whether on longer sentences or paragraphs, the approach is identical. Suppose the first method is to be used. The student types through the sentence or paragraph at a speed considerably below his best rate, merely to "get the feel." In doing this, he can note difficulties as they arise. Normally, it is better to complete the paragraph at least once, typing as steadily and accurately as possible at the rate with which the typing commences. Write at a rather low rate and suppress the tendency to speed up even though the matter favors it. After selecting the difficult places, intensive practice should follow. Since the largest possible learning units should be preferred to smaller ones, a phrase or a group of words should be selected, if possible, rather than a single word. If the phrase proves too difficult, select the specific word that seems to cause the trouble. If the word still proves too difficult, take that unit within it that gives the greatest trouble. Only rarely will it be necessary to descend to the individual stroke level to improve some infrequently used or poorly mastered character making movement. As the operator enlarges his typing vocabulary in this manner, he will soon learn to skip common words and others that he recognizes as having been mastered previously, putting the full force of his effort upon those on which he hesitates or lacks what may be described as a desirable speed, accuracy, and fluency.

After mastering the words in the paragraph it may then be repeated at least once, with the main aim for accuracy and as perfect fluency as can be developed at a rate above the first practice speed and below the speed used when dealing with the words and phrases as units. Practice of this kind makes real demands upon the consciousness of the student. It requires intelligence in determining mental set before the paragraph is typed each time, and in maintaining the correct aim throughout each repetition. It develops the control of the mental skills, particularly the all important one that governs the conscious choice and maintenance of the rate of speed used. Teachers often complain about students typing too fast, going wild over speed, when they mean, perhaps, that they lack control of speed. The above plan of practice suggests a method for controlling speed and actually constitutes a method for developing continuous typing. The expert acquires control through this sort of practice plan. The mediocre typist never does. A good practice procedure on the right kind of material is a necessary part of the student's equipment if he is to develop his skill completely and efficiently.

This type of practice should be indulged in as long as the typist hopes to improve his fundamental and practical skill. Some successful teachers feel that much of the first year should be spent in the pursuit of this skill. A few teachers secure an average of 45 to 50 words per minute net from their two semester typists, and there seems to be no good reason why this should not be approximated by all teachers who can keep worth while aims steadily in view and who can modify their textbooks and teaching to fit the need. It is recommended that much of the first semester, after the keyboard is taught, be devoted to pure skill development, saving the application of fundamental skill to practical business correspondence and papers for the second semester. If fundamental skill is developed first, the form work can be done so much more quickly and better, resulting in a saving in learning time. During the second year of typing for vocational students, much time can be allotted to such practice. The typist should constantly be reminded of his need for improved basic skill in continuous typing by having a regular program that includes some continuous typing practice and will be highly motivated the last few weeks of each semester. The competitive timed test is best for this purpose.

The individual student's needs cannot be met by ostentatious teaching procedures that overemphasize and overemploy unison drill. Unless the drill is on particular problems that the individual learner needs to solve and properly paced at rates that force him to strive vigorously and intelligently, it will subtract from rather than add to his performance, his thinking, and his action. Although drill has limitations, it also has decided advantages, if properly directed. Effective drill is not mere finger movement. Neither is it effective when students are asked to type so much material without understanding what the drill on that material is supposed to do to them, or for them. It is most important to check on the changes in typing behavior that the drill produced. The best progress in the skill of typing is made when practice is regular, systematic, and well planned. Practice is entered into most enthusiastically when it is known to be directly correlated with regular checkups, the results of which will be revealed so that all may see and make comparisons. Isolated drill work is greatly exaggerated resulting in the deadening of student interest. Word practice can be more fruitful and properly pursued than isolated letter practice. Less proof has been submitted to prove the superiority of sentence practice over word practice. When not influenced by nervous diseases,

practice enables nearly all to make groups of four, five, or six characters with great rapidity. Measurements have shown this rate to be as high as twelve a second. Letters forming words are written much more rapidly and with greater precision than letters taken at random. The same is true of words in connected discourse as compared with words in random order. It is worthy of note that since 1917 many professional typists have averaged twelve or more strokes a second for 60 minutes of continuous typing from unfamiliar copy. Finally, it is the teacher's responsibility to find some adequate means of arousing enthusiastic interest in the right kind of practice material for each gain that is sought.

Types of Drills. Many different types of drills are in use in typing, as an examination of a few of the modern textbooks and drill booklets will reveal. Each drill has some value, but no one drill is good for all purposes. The authors of these books have tried to help the teacher by giving each drill a meaningful name, but, after all, it is the teacher who must decide when and for what the drill must be used. A few of the more common drills will be explained, illustrated, and evaluated.

Location Drill. The location drill starts from the home key location, introduces other letters to be struck by the same fingers, and then returns to the home key for the last stroke. The purpose is to stress the reaches from the home key, and the drill unquestionably does provide such practice. The drill helps to establish an association between the key to be controlled and the controlling finger. Examples *frf jmj sw2s k18k asdfgf ,lkjh*. The two principal uses of this drill are (1) to introduce new letters during the keyboard learning, and (2) to provide an excellent corrective drill for reach errors made by all students. Beyond these two uses, it has little value.

Warm up Drill. Warm up drills are used to limber up the fingers at the beginning of each class period, just as the athlete finds an exercise helpful before entering a game or beginning any practice work. The beginning typist can use a simple drill to warm up in just a few days after his learning begins. The advanced student will get the "feel of the keys" if five or ten lines are written before beginning the regular practice. There is also some value in the encouragement they give to rapid stroking.

The Expert's Rhythm Drill is a warm up favorite. It was invented by the experts to enable typists to recall their highest stroking speeds and rhythm in the shortest possible time. In using it, both teachers

and students should always keep in mind the prime purpose of the drill. It is not rhythm alone, nor is it speed alone, nor even correct stroking alone, but it is all three. The absence of reached strokes, with the exception of the easy *g* and *h* strokes, makes it possible to attain the greatest speed in the shortest time. It also enables the typist to concentrate his full attention on maintaining correct hand position and a snappy blow with a quick release of the key. While most beginners start to learn the sequence of the drill in terms of the characters typed, execution should be speeded up from the first, and the typist's attention should swing entirely away from the characters being typed to the fingers being used. In other words, attention should be directed almost exclusively to a control of speed, power, and rhythm through the kinaesthetic sense. This transfer to a kinaesthetic control should be made as early as possible. Even the advanced typist should begin the drill rather slowly and gradually bring it up to the highest possible speed. It is an excellent drill to warm up cold fingers, to limber up stiff fingers, or to bring clumsy fingers under control. This is the drill *a,sldkfjghfjdksla*, etc.

Concentration Drills Concentration drills aim to hold the attention on to the copy and thus make the student think. These drills consist of a changing line, so that the student is compelled to concentrate his attention on the copy. The concentration drill may be difficult material as to content or stroking, or it may be easy, with some repetition of sequences with just enough change to force attention, as *ai ail fail fails failed failing failure*.

One Finger Word Drills One finger word drills consist of words that require the use of no more than one finger for their writing, like the second finger of one hand or of both hands. They are usually slow-writing words, yet their writing is too fatiguing for a great deal of practice at one time. If the practice is distributed, their writing may be greatly eased up. Example *my so but did low hum nun papa hunt turn*.

One Hand Word Drills One hand word drills consist of words written with either the right or the left hand and are naturally slow of writing. They are best practiced alternately because they are less fatiguing that way. More words are written with the left hand than with the right.

Double-Letter Words Double letter words are practiced to develop greater smoothness, for they are apt to be written irregularly, causing a break in rhythm.

Corrective Drills Any drill used for corrective purposes becomes a Corrective Drill In a later chapter some suggestions will be made as to what drills to use for the correction of certain difficulties

There are other kinds of drills, but these described are those most commonly used

Finger Gymnastics. Any use of the fingers that stimulates movements required at the typewriter is useful and has an influence on the progress of the students Training of any sort that tends to give finger control may be helpful

Finger gymnastics have a certain value in the development of the muscles used and a still greater value in helping the pupil relax Muscle loosening drills, such as bending the fingers, stretching them, separating them, closing them against the cushions of the palms, and, with limp wrists, shaking the hands in the air, may prove helpful to stiff or clumsy fingers On cold mornings or when the typing room is chilly, these exercises may be used to decided advantage Oftentimes, physical handicaps of students may be greatly benefited by appropriate exercises done by the student at home

CLASS DISCUSSION QUESTIONS

- 1 What is the psychological explanation for the statement, "Fast motions cannot be acquired by practicing slow ones?"
- 2 Discuss more fully the statement, It is the quality of the student's effort that counts, not the quality of his product
- 3 In what ways can the text material be adapted to fit the needs of the cycle of emphasis used by the teacher of typewriting?
- 4 What is the present order of teaching emphasis for the three main objectives in teaching typewriting?
- 5 Which of the two major objectives—fundamental skill development and practical application of skill—is the more complex and why?
- 6 Compare the three subdivisions of these two major objectives—knowledge, attitudes and skills—as they relate to each objective
- 7 How important has been the influence of terminology in typing instruction? Compare the terms used in three of the most popular typing text books to see if different names are used for the same thing
- 8 Make a list of the terms used in the keyboard section of three of the most popular typing textbooks and explain their meanings
- 9 Should teachers accept without evaluation any new ideas regarding skill? Consider carefully the four groups of questions for the evaluation of new ideas for skill development and explain, verify, or modify these ideas
- 10 Set up a criterion for the evaluation of the efforts of speakers or writers on skill development in typewriting

- 11 What three factors characterize skill in typewriting?
- 12 Explain what is meant by fluency
- 13 Explain the meaning of the three levels of fundamental or basic skill
- 14 What techniques in typing need a recurring emphasis and review?
- 15 Since the emphasis on speed and accuracy should be kept in balance, explain the teacher's part and the student's part in the procedure
- 16 Discuss the routine that is basic to skill development. What are the advantages of such a practice period?
17. How important is drill to skill development in typewriting?
- 18 Add one more drill to those given to illustrate each of the ten types of drills

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CHAPTER X

The Problem of Controlled Writing

Accuracy Is Control. The problem of accuracy in typewriting is the problem of control. Therefore, the basis of accurate typing is physical and mental control. Physical control can usually be fairly well established by correct methods of practice combined with control as to position at the machine, technique of operation, use of the eyes in copy reading, nerves while writing under stress, and the development of the necessary endurance for long periods of work. A gymnasium period just preceding the typing period will cause the students to be physically exhausted when they come to the typing class and make physical control difficult. Also, errors may result from excessive fatigue due to faulty posture or faulty hand position on the keyboard.

Mental control, however, is conditioned by a great many factors, some of which originate outside the classroom. Light, heat, and ventilation can be regulated. If they are not, such conditions may prove distracting and thus cause errors. Tenseness, emotional stress, worry, fear of error making, lack of sleep, or inadequate nourishment may account for inaccuracy, because mental control is hampered. Unfavorable criticism of a class or some member of it before a test may produce bad results. Annoying mannerisms of the teacher, such as a nasal or odd quality of voice, a hurried, nervous manner, or a new, unfamiliar routine, have been known to affect accuracy because they produced unfavorable reactions or extreme tenseness on the part of the students. Even constant emphasis on errors may produce conditions for making more errors—the students become “error minded.” A student who can-

not concentrate thoroughly on his writing is perhaps being disturbed because a neighboring student writes much faster than he does. He may be happier *sitting next to someone who is slower than he is*, so that he may set the pace.

Control comes from poise and from confidence in one's ability to perform and is acquired by hours of right practice and mastery of correct technique. One would not expect a student to have this at the beginning of the course. After a student has a writing rate of 30 words a minute, a large number of errors may be caused by faulty copy reading. To recognize a word with all its letters in the right order means reducing the normal reading rate and also changing the normal method of reading. Rhythm can still be maintained, but the tempo must change as difficult letter combinations or high frequency words appear in the copy. Many students have difficulty with this procedure. Then there are the errors that appear because the student is writing at a rate that is too fast to allow him to control the process. On the other hand, hesitation is fatal, because it produces spasmodic efforts and indicates a lack of mental control. Typing is a wonderful developer of mental alertness and concentration. If the mind wanders for only a fraction of a second, the damage may be done. Nearly all typing errors may be traced to a lack of physical or mental control. Since the mind governs the body, it follows that even the errors caused by a lack of physical control may be eliminated by a more complete degree of mental control. This gives greater continuity of writing, which distinguishes the expert stage of typing skill.

The Early Idea of Accuracy. Accuracy has long been the chief goal of most teachers, who have regarded it as equal in importance to speed. Errors in the typed copy have been the objective toward which teachers' pencils have been aimed in paper checking. Errors have been the focal point for much valuable or worthless practice, depending on whether the true cause of the errors was identified by the student or whether he merely applied himself to the task of fulfilling the teacher's requirement of practice.

In the first typing text to use the word "touch"—that by Bates Torrey—the student was permitted to type a number of exercises before error checking commenced. Thereafter, if an error occurred, the whole task was repeated. This exemplifies perfectly the attitude of the early teachers toward accuracy. Errors were not to be made, but, when they did occur, they merited punishment. The theory of learning

based on satisfaction to be attained was then apparently unknown, as was also the idea that any error is the result of a specific cause and that, if the purpose is to eliminate the error, one need only to discover and eliminate the specific cause. This ancient practice is still with us to some extent, although it destroys interest, kills motivation, creates a dangerous fear complex fatal to speed and rhythm, encourages constant disregard for and violation of good technique, and often fails in the end to eliminate the errors.

Next came the idea of demanding a certain number of repetitions of the word or line in which the error had occurred. This centered attention and remedial effort on the word in which the error occurred but did not attack the cause of the error. Expert operators soon noticed that often the real cause of the error was misdirected attention or perhaps a difficult combination that resulted in an awkward positioning of the hands for a subsequent word, so that, while no error was made on the difficult combination, one was made subsequently on another word, which might be less difficult. The procedure was, therefore, to practice the whole line in which the error appeared. Students often practiced words too, and sometimes parts of words, but only when they were convinced that the cause of the error could be thus directly attacked with a reasonable hope of eliminating it. Criticism of this plan parallels the common criticism of all repetition practice in all subjects. Lacking proper motivation, any student engaged in repetition practice may treat it as a routine task to be discharged with the least possible effort and time, hence no permanent good will result. However, a sufficient number of repetitions, intensively made, are bound to originate, improve, and fix certain kinaesthetically controlled skills.

Then there originated the idea of developing a technique in each subject for identifying difficulties, diagnosing them, and providing remedial or corrective practice to eliminate them. It attained a tremendous popularity and still continues to be used. In principle, this method is a more carefully detailed analysis of errors, together with special drills, intended to be of a remedial nature. This device consisted of a chart for analyzing errors, but it provided no insight into the cause of the error, when this and the desire to remove the cause are the only reasons for gathering, studying, and analyzing errors.

For many years it was assumed that, if students were permitted to make errors, they would never learn to type accurately. Eventually, it was discovered that even students who were taught under the "perfect-

tion" requirement did not always type perfectly, hence the practice did not develop accurate writing. Neither did it develop the desired objective, and it carried with it certain undesirable features, like fear, discouragement, and even a dislike for typing. There are few tasks in life that require perfection of beginners, so why should skill development in typing do so? The muscles must be trained to respond in new ways, and such training requires time and effort.

The Modern Attitude Toward Accuracy Eventually, a different attitude toward accuracy developed. Teachers tried to have their students improve in accuracy, rather than expect them to achieve it, at the beginning of the learning. Teachers recognized that the beginner was more or less confused by the large number of keys to be struck correctly and no longer criticized the number of errors he made on his first attempts, urging him to try to do better on the next attempt. Thus, he might achieve accuracy without fear and discouragement.

Although most teachers no longer require students to type perfect work, many teachers still stress accuracy too much during the first semester. Accuracy and speed cannot be attained separately but must be developed simultaneously. The fear that accuracy will never be achieved unless it is maintained from the beginning is vanishing. In most texts, the beginning exercises are so simple that beginners can write them both speedily and accurately. With the accuracy requirements less rigid, a greater speed may be developed from the start than was formerly attained.

Obviously then, both speed and accuracy are goals in typing and are variously emphasized by authors and text materials and interpreted by teachers. Lessenberry says

No teacher of typewriting objects to the development of speed by his students, no matter how emphatic he may be in support of the goal of accuracy. Similarly, no teacher who believes in speed first objects to the achievement of accuracy. On the contrary all of us believe in speed with accuracy even though we are divided on how to achieve this commonly accepted goal.¹

It is not necessary to go to extremes in working for either accuracy or speed, for neither is worth much without the other. The "speed-first" emphasis is not understood by many teachers. It does not mean

¹ D. D. Lessenberry, "Some Debatable Issues in the Teaching of Typewriting," *National Business Education Quarterly*, December 1943.

"hell bent for speed" It means the emphasis on speed of stroking as a part of correct technique, it means that early errors are less important than correct techniques, it means that errors will tend to disappear if techniques are improved, in fact, it means that early errors may be accidental and will, therefore, disappear later In truth, this is saying that in the early lessons the goal of the practice is not the finished and usable page of typed material, but the initiation of right techniques that will later bring typing control Any fixed demand that causes the learner to become hurried, tense, worried, or confused is basically unsound, just as any fixed demand that causes the learner to build slow stroking to get accuracy This means that students who are forced to maintain too rapid stroking will be just as handicapped as those who are forced to type under a strict error limit Too rapid a stroking rate may be as dangerous as too much emphasis on accuracy

The goal of "speed first" is that each student should work up to his best learning, unhampered by artificial standards of error requirements It means that each student should be encouraged to develop *his* best stroking rate This calls for individualized instruction within the class, whether the class be large or small Each student should be helped to select his goal to be achieved through the practice He should know how to appraise the effectiveness of the procedure used There is little need to argue the question of speed versus accuracy provided the difference between the uncontrolled learning period and the production period with no new speed goals set is kept in mind The wise teacher will know when to apply pressure and when to withdraw it, when to shift the emphasis from speed to accuracy, or the reverse The modern goal for the early learning period is to speed up and then drop back to consolidate the gains at a slightly slower pace, with control always the goal The student's interest will be held, for he will have his individual goal and will feel he is helping to solve his own learning problem The teacher will assume, then, a co operative, advisory role

What Causes Errors? There has been much naive thinking about errors, most of which has resulted from supposing that a mistake in the typed copy is the only form of "error", whereas errors in technique cause reduced speed, lack of fluency, and errors in general A hesitation in the writing, for example, is a technique error, and, while it may not result in an error in the typing, yet it slows speed It would not be recorded on an error chart or penalized, but it is as bad as some other

faults that are recognized. A light letter is also a technique error, but it is not a penalized one. Its cause is unskillful stroking, and behind this immediate cause may lie a chain of mental and physical causes serious enough to claim the attention of the teacher and the student.

The point is errors are usually considered as ends in themselves, when they should be considered as symptoms of something. A symptom of a learning difficulty must be studied in relation to the learner, and not apart from the learner. The first thing to know about errors, then, is how the typist felt about the typing as he was doing it. This may give a clue to the cause of the error and help in deciding upon the remedy.

The possible causes for any given error may be many. They may lie in the mental or physical fields. They may represent inattention, misdirected attention, emotional disturbances, conflicting skills, a momentary and perhaps entirely unconscious attempt to surpass the safe limits of the skill possessed on a given stroke or combination, or a plain misstroke caused by previous wrong or inadequate learning of physical reaching and stroking. Most of the worry about errors is centered around the keyboard errors, yet nonkeyboard errors may be just as much a handicap to the development of competency in typing as keyboard errors.

Generally speaking, errors may be caused by many things—inattention to copy, muscular tenseness, hurried and spasmodic effort to type, faulty reading habits, inadequate or incorrect conditioning for the work, and a dozen other things. Some can be identified, but many are obscure. This much is known, that every error in typing has a cause, which may be obscure and even impossible of discovery, nevertheless, it is present. Unless the cause is removed, the error may be expected to reoccur. To recommend practicing the letter *b* simply because it has been struck in error, without further regard to the whole situation, is to treat the symptom and ignore the cause. To give general corrective drills without regard to individual needs is like prescribing one kind of medicine to treat all diseases.

A list of errors and their causes may be obtained by studying the literature of typing. Research must determine whether they are the true causes, by the construction of drills based upon presumed causes and by the measurement of the effectiveness of the drills in removing the cause, as measured by the symptom. Teachers are too loath to give students information of this kind. They seem to fear their inability to

guide and direct the student in the study Yet typing errors are the concern of most teachers and students

The Meaning of Accuracy Controlled writing produces accurate work because errors are eliminated from the process Most teachers would agree that a 5 minute timed test with but one or two errors would be an accurate test, while a test without error would probably be called a perfect test

There are six phases to the problem of accuracy in typing (1) conformity to the *rules* that declare what is and what is not an error, these may be the International Rules for typewritten work or an adaptation of them, (2) need of conformity to the best accepted *forms* for typewritten material, these are determined by the authors of textbooks and the business world, (3) the *performance* of the operator, which is dependent upon the technique used, (4) the *procedure*, which is dependent upon the work habits of the typist, for example, whether he does a piece of tabulation, column by column or line by line, the line by line method being the correct procedure, (5) the *reading habits* of the typist—how well he can adapt his reading ability to his skill of typing, and (6) the actual *writing or stroking* of the keys All six of these factors are necessary to accuracy and the development of skill Failure in any of them produces inaccuracy

Therefore, the word "accuracy" usually suggests errors, and errors should seldom be used as the sole measure of ability to type Teachers talk too much about accuracy and making errors This makes students error conscious, so more errors result Instead, teachers should talk about more controlled writing, for greater control gives greater accuracy, and, after all, "control" is a more meaningful word to the student than "accuracy," or can be made so

The Classification of Errors Many efforts have been made to classify errors in typing The first attempt made three classes—errors of mind, of motion, and of machine This was too general a classification, and it was impossible to determine in which class many errors belonged For example, the indented margin error could be a machine error or the result of a bad carriage throw motion

After making a study of the types of errors found in the tests of the World's Championship Contests, prior to 1924, Dr William F Book set up a classification of errors in Chapter XIV, of his book *Learning to Typewrite* His classification presents the various kinds of errors that cause most trouble for typists and for learners of typing, arranged

according to the department of the work in which the errors occur. It is somewhat technical yet understandable by the average student.

A few years later, Noble B. Morrison, while a graduate student at the University of Iowa, made a study of errors on the basis of how they were classified by businessmen.¹ In his report of the study he says he attempted to arrive at some logical classification of errors as to (1) relative weight, (2) what errors a letter may contain if any, and still be mailable, (3) what errors a letter may contain that may be corrected, and (4) what errors will cause a letter ordinarily to be considered unmailable. The most significant finding of the study is that errors differ decidedly in seriousness and that, as a consequence, any plan of grading that considers errors equally important or gives to all types a common penalty (such as a deduction of ten words) is grossly incorrect.

D. D. Lessenberry says, "Classification is the first step in an analysis of errors."² He says further that, just as it is often impossible to know the exact cause of an error when it is studied apart from the student who made it, so it is difficult to say that an error belongs to one particular classification. For example, there is a constant overlapping between the errors caused by a basic failure to understand and those that are errors in manipulation. Probably the error of lack of uniform indentions in paragraphing could be classified either as an error in understanding (not understanding the correct way to control the tabular key) or an error in manipulation (not controlling the tabular key correctly). Likewise, keyboard errors may be caused much more often by the fear of making an error than by faulty stroking technique or incorrect manipulation. Fear is a psychological influence that usually produces a physical tenseness of muscles that eventually shows up in inaccurate stroking or in the constant movement of the eyes from the copy to the typewriter. Mr. Lessenberry's classification follows:

- I Errors in stroking technique resulting in
 - 1 Spasmodic typing which lacks flow or continuity
 - 2 So called rhythmic ruts (or a fixed typing rate) which will set limitations on speed development
 - 3 Inaccurate control of keys

¹ Noble B. Morrison, "Evaluation of Errors in Typing," *National Business Education Quarterly*, December 1932.

² D. D. Lessenberry, "Diagnosing Typewriting Errors," *Business Education World*, April 1936.

- II. Errors in basic knowledge or in understanding, resulting in.
 - 1 Missyllabication
 - 2 Inaccurate method of expressing numbers
 - 3 Incorrect capitalization, punctuation, spelling, and paragraphing
 - 4 Unacceptable arrangement of work
 - 5 Failure to follow directions (specifically stated or implied by the nature of the material typed)
- III Errors in manipulation, resulting in
 - 1 Imperfect left margin
 - 2 Imperfect shifting for capitals
 - 3 Inaccurate alignment
 - 4 Failure to space between words
 - 5 Extra spacing between letters
 - 6 Lack of uniform indentions for paragraphs
 - 7 Failure to start typing the succeeding line immediately after re turning the carriage
 - 8 Clashing of keys
- IV Errors in reading copy, resulting in
 - 1 Changes in word sequence, in punctuation, in paragraphing, or in use of capitals
 - 2 Addition of word or phrase
 - 3 Omission of word, phrase, or line
 - 4 Transposition of words

The author wishes to suggest a still different classification of errors, believing it to be simpler than some, hence more practical for student as well as for teacher use

1 *Reach errors* as *m* for *n*—misdirected, 3 for *e*—overreach, *k* for *i*—underreach, *g* for *b*—too high, *h* for *y*—too low

2 *Substitution error* use of the wrong finger or hand for the correct one, as *a* for *s* and *e* for *t*, wrong word for the correct one

3 *Manipulation error* faulty shift giving raised capitals or misplaced small letters after the shift, double spacing between words due to prolonged space stroke, crowding four letters into the space that three should occupy, piling of letters, ghost letters, keys sticking and piling up at printing point

4 *Machine error* indented or extended margin, irregular spacing between lines, double spacing between words, or any error due to failure of the machine to function properly

5 *Speed error* failure to space between short words, crowding and piling due to forcing the machine too fast, raised capital letters due to hasty shifting, clipping off the first or last letter of a word

6 *Accidental error* finger glancing off a key, throwing the carriage too soon, leaving out words when changing paper, turning two pages of the copy, starting errors, as forgetting to indent or releasing the shift, stopping errors, when time is called

7 *Ignorance* any error made because the writer did not know it was an

error, like long or short lines caused by not knowing the rule, wrong spacing after punctuation marks, or short pages

8 *Omission of letters or spaces* when weak fingers strike so lightly that the letter fails to register, like *tht* for *that*, forgetting to space between words

9 *Addition of letters or spaces* holding space bar too long, striking space bar too high so *n* is written in space between words, doubling the last letter or any letter of a word, like *plann* for *plan* and *omission* for *omission*

10 *Transposition of letters or words* mind working one step ahead of the fingers, slow typist transposes letters, like *hte*, and the fast typist transposes words, like *the of*

11 *Anticipation error* letting the mind run ahead of the writing so that some letter in a word ahead is written instead of the letter that should have been written, like *womorrow* for *tomorrow*, or, as with the faster writer, some word ahead may be anticipated and written This error belongs to the fast reader

12 *Motorization error* made through the influence of a motonized vocabulary The sequence of letters in a word suggests a sequence that has been motonized, like *withing* for *within* or *enought* for *enough*

13 *Inattention error* mind wandering causing changes in word or letter sequence, omission or repetition of words, phrases, or a line, misspelling of words, like *judgement* for *judgment*, spacing in the body of a word When the eyes move to the beginning of a new line of the copy, they may drop down two lines or pick up the same line if the writer is thinking of some thing else

14 *Distraction error* results when the eyes are taken away from the copy because of some other influence like someone entering the room omission, insertion, or repetition of words phrases or lines

15 *Mechanics of writing* errors due to incorrect capitalization, paragraphing, punctuation syllabication, etc

The above classifications are not alike although each attempts to deal with the same thing—errors No matter how thorough any analysis of errors may seem to be, it should never be assumed that it covers everything or solves the whole error problem Such studies usually assume that all other things are equal, and this is seldom the case Hence the importance of never studying a student's errors apart from the individual making them His personal traits, his home life, his school influences, his teacher's influence, or his physical and mental handicaps—all are actualities that determine the kinds of errors he makes But even more vitally important than these is the unwarranted assumption that most of the errors made really have some hidden meaning that a classification scheme will reveal Besides constant errors, there are accidental or variable errors, due to slight momentary causes This variability cannot be eliminated entirely Particularly in the beginning lessons, many errors are due to brief lapses in attention or

memory, careless thinking, tension, emotional disturbances, or fatigue. Since no amount of manual remedial practice can correct such errors, they should be ignored unless they occur too frequently. A very high percentage of all errors made, especially with beginners, are "happenstance" errors, and to classify them would seem to be a waste of time. It is the constant, common error that needs classification and study.

The Use of Error Charts. The error chart in typing was developed in the effort to discover errors of a persistent nature. The term "error chart" has been used to describe any chart that attempts to analyze or diagnose the errors made on certain pieces of work or on timed tests over a given period of time. It was intended that remedial practice designed to correct the errors charted follow the charting. Although the error chart was accepted unquestioningly by the majority of teachers for several years, the benefits resulting from its use proved to be slight. The basis upon which most of these charts have been constructed is that one letter was struck for some other letter.

The chief criticism offered on the use of error charts is that the chart itself offers little suggestion as to the cause of the error, when its specified purpose is really to diagnose the cause for error. So the question is, does it succeed in providing a basis for diagnosis? The recording of errors on the assumption that one letter is struck for another merely because the stroke has been confused tends to focus the attention of the student on errors in result rather than to direct his attention to the error in technique that is responsible for the misstroke. The fact that the real error was in lack of mental control, permitting the substitution of an habitual response for one that has not become automatized, is not even hinted at in the way the error is recorded. It is impossible in a large class for the teacher to make all remedial recommendations on the day the error occurs. Since time must elapse before he can confer with the student, too long a period is likely to occur between recognition of need for improvement and suggestions for remedial drill. The result may be the development of faulty technique. This is no doubt what Harold H. Smith had in mind when he said

One of the principles of learning is that effort for improvement should follow immediately upon the recognition of the need for improvement. This casts a shadow, amounting to a ban, on the whole charting procedure.¹

¹ Harold H. Smith, "Problems in Diagnostic Testing and Remedial Teaching as Applied to Typewriting," *Second Yearbook, Commercial Education Association of New York City and Vicinity*, 1932.

The basic fact that most errors in typing are caused by violation of some concept of perfect technique has been completely ignored by error charts because they provide no adequate check on technique errors. Most errors are simply recorded as substitution errors. Lastly, the diagnosis of errors on timed writings is condemned by many. Since the students will not type the same amount of material, intelligent interpretation of results is impossible because of the variation in opportunity for error. Therefore, if analysis of key stroking errors on specific keys is to be accurate, all students in the group must have the same opportunity for error, or the results will be meaningless.

Teachers know the drudgery that attaches merely to close checking of a page of typing. If to this is added the laborious recording on a chart of tallies for each error, with subsequent computation of the tallies, adding the columns and ranking the results, with the certainty that in the end all this work will not surely identify the basic cause of a single error so charged, there is no good reason for placing any confidence in or making use of such a plan. Thus, the deficiencies in the error chart have been recognized, and leaders in the field of typing have made suggestions intended to overcome the difficulties encountered in their use. One such suggestion made by a typing authority recommends selecting for corrective practice those words, phrases, sentences, or lines in which an error has been made and practicing them as soon as possible after the error occurred.

Katherine S. Humphrey says that all errors are not of like nature or of equal importance, so practice on the words in which the errors occur may not be in the least helpful. She proves her point by this example:

Transposition may be a persistent error occurring several times on one test, but practice on the two or three words in which the transposition occurs does not correct the tendency to repeat the error in other words or combinations unless the student is thoroughly informed regarding the erroneous mental process which is responsible for the error.¹

Several technique check sheets have been prepared. These tend to make up for the failure of the error chart to record errors in technique.

The Problem of Error Analysis To be most effective, the problem of the analysis of errors is an individual one, for the analysis must be made by or for each student. It is absolutely essential that the indi-

¹ Katherine S. Humphrey, "Constructive Analysis of Typewriting Errors," *Business Education World*, February, 1944.

vidual student's errors be studied in order that the proper corrective drills may be given for his particular difficulties. Error analysis is really error study, in which the student must share with the teacher the responsibility of noting all inaccuracies in the writing, but the teacher must direct the analysis and assign the corrective drills. The analysis must attempt to study each phase of typing skill, and not just one.

Naturally, finding the error is the first step in error analysis. The next step is to identify it and then intelligently determine the cause of the error. The last step is the corrective measure and the conscientious practice necessary to eliminate the error.

The student must be taught to find his errors. This is a matter of cultivating his powers of observation. He should work with the objective of becoming as skillful in this as his teacher, and it is possible that he might even be better than his teacher. To be a diagnostician requires thorough training, great skill, and practice. These are hardly to be found in the student, but he can co-operate with the teacher to great advantage to himself. The teacher may have no logical basis for classifying the errors, and hence cannot think of all the possible causes of a given error, but oftentimes the student can tell just what the cause was. It would be difficult for the student to take over the diagnosis all at once, so it should be a matter of a gradual growth. The student will need help and encouragement. He should be led to think of his errors, not as just mistakes that might not occur again, but as opportunities, challenges, and directives for further learning. Remedial thinking must precede corrective practice or there is likely to be little improvement. The teacher needs to listen to the student type, to observe him at work, and not rely upon the typed page to tell the whole story.

Space does not permit the illustration of the different kinds of devices that may be used for error analysis. In 1927, D. D. Lessenberry made a comprehensive study of awards papers sent to the L. C. Smith & Corona Typewriters, Inc., from students in every section of the United States. The error chart he developed is doubtless familiar to everyone. Its greatest usefulness is to identify those reach errors most commonly made. A study made today would probably be in quite general agreement with the results of his study. His error chart shows the ten commonest reach errors to be (1) *m* for *n*, (2) *r* for *t*, (3) *t* for *r*, (4) *o* for *i*, (5) *n* for *m*, (6) *s* for *d*, (7) *r* for *e*, (8) *e* for *i*,

(9) *a* for *s*, and (10) *v* for *b* There is no doubt that the frequency of use of the letters as well as the difficult location of some of the letters on the keyboard has a marked influence on the high frequency of these errors

Common and persistent errors should be identified as soon as possible and remedial work begun at once to eliminate them A record sheet can be devised that will provide a study of each long timed test Such a sheet will not only teach the student to classify his errors but will encourage more interest in his tests and provide the teacher with an excellent basis for corrective measures

A personal error analysis chart that overcomes many of the criticisms of earlier error charts was developed by Katherine S Humphrey and published in the *Business Education World*, in April, 1944 It is a detailed outline of the common typing errors and permits a description of the cause for most of them Therefore, it would prove instructive to the student The author does not advocate such a chart for daily use, because, like most such devices, its use takes time that might well be spent in practice The recording of errors on timed writings once or twice a week is sufficient, its author believes, to give the student adequate information regarding his errors It is individual—each student has his own chart and is to analyze his own errors with the direction and guidance of the teacher Before the work is begun, there should be a detailed discussion of the points in the outline, to familiarize the student with the various groupings of errors This chart was designed on the theory that the student must develop the ability to understand and overcome his own difficulties The teacher should find ways of using the results of these error recordings for the benefit of the class and of individual students When the student has become accustomed to using the chart, the remedial drills preferred by the teacher may be used without delay According to its author, the personal error analysis chart does not offer a complete solution of the error problem, but she believes it does offer an educationally sound approach to the problem of errors

Several authors have prepared special technique check sheets that tend to make up for the failure of the error charts to record errors in technique In these special technique charts it is essential that the teacher watch the student as he types, in order to check certain sections in the chart These technique check sheets are effective in bringing to the attention of both teacher and student specific technical

faults that need to be watched. The sheets deal, however, largely with types of errors that result only in a slowing down of the typing process rather than with the types of technical errors that create false strokes.

One of the best technique check sheets is the one included in the workbook for *Twentieth Century Typewriting* by D. D. Lessenberry. Of it, Mr. Lessenberry says:

Pupils must be taught the necessity for correct working habits and accurate self appraisal. Many devices may be used for this. Perhaps no device is more productive of good results than some form of a technique check sheet for the teacher's use as a daily observation chart, and a listing for the pupil of the remedial work that must be done. The use of this technique check sheet forces the pupil to do remedial thinking before he does corrective practice.

The Remedial Treatment of Errors. There are times when typewriting errors should be ignored, there are times when they should be studied as the basis for remedial practice, and there are times when they should be erased and corrected. Thus the problem is when to ignore, study, erase, and correct errors, and the solution to this problem lies in the purpose of the typing practice in which the errors are made. D. D. Lessenberry says:

Errors should be ignored when the purpose of the practice is to push into new speed areas. To "feel out" a new speed before stroking patterns have been worked out is important in spite of errors. The only consideration to be given to them is that a check may be made to see that they do not exceed two or three or possibly four a minute. When pushing for a new speed, whether through timed writings or through class drills, more than two or three errors a minute should be taken as a signal that the student is overwriting, that the drill is too intense. There is no grave danger to ultimate control if the errors do not exceed four or five a minute under this plan of forcing speed, but it is a little safer to let two or three errors a minute be the flashing of the red light meaning "Danger."¹

Errors made in drill work should be ignored, since the purpose of drill is generally to modify typing behavior. This purpose may be to push for a new speed, to build control, or to emphasize related knowledge. The reason for this is obvious: to center the thought of the student on holding down his errors will hinder the achievement of the purpose of the drill when that purpose is other than error control.

¹ D. D. Lessenberry, "Typewriting Errors and Corrective Measures," *Balance Sheet*, April, 1948.

In the first practice of new problem material, errors can safely be ignored, since such practice serves as an experimental tryout. Errors may be studied when the typewriting is held to a rate that is slower than the student's forced speed. It is characteristic of errors that they multiply as soon as the student becomes conscious of making too many of them. As has been said before, the more the teacher talks about errors and the more the student thinks about them, the more errors he will make. In most offices, work is acceptable when errors are neatly erased and corrected. Therefore, the aim of the typewriting course in the school should be the ability to produce acceptable work, and the many hours of practice should achieve this goal.

What, then, should be done about errors? The most common procedure has been for the teacher to check the student's paper, marking the errors made, then when the number of errors becomes too great, the teacher admonishes the student by telling him he is making too many errors. The teacher may then urge him to be more careful, perhaps suggest that he write more slowly or repeat the copy, but this plan usually fails entirely to get at the seat of the difficulty because neither the teacher nor the student knows exactly wherein the trouble lies. The student might well be discouraged when the teacher gives him so little help, and the teacher is not entirely to blame for his failure to give more effective help. Probably the teacher has not received any training in the diagnosis of difficulties and in the complex process of devising effective remedial drills because very little material on this subject has been available in typewriting literature. Thus, the persistent question, "What shall we do about errors?" is asked by the progressive teachers of typing. D. D. Lessenberry has answered the question thus: "There are times when nothing should be done about them, then, there are times when a careful analysis should be made of errors to understand the defects in technique of which the errors are symptoms."

Harold H. Smith says in answer to the question

The only pedagogically defensible and the most practical way to eliminate any particular error and to improve the technique sufficiently to substitute accurate control of similar situations is (1) to practice intensively on the stroke, combination, or word in which the error occurred and (2) to fit that stroke, combination, or word into the situation in which the error occurred—usually into a sentence—and practice that until it can be typed with the greatest possible speed, accuracy, and fluency.

Dr W F Book answers the question thus

An accurate analysis of errors will reveal to teachers and learners alike the type of difficulty that is being encountered at each stage of practice as well as the seriousness of each kind of mistake. If the cause of these mistakes is known, it will open up the way for giving to learners the exact kind of help they need to prevent or to correct these tendencies to error, and so will enable teachers to give to their learners the exact kind of direction they need to make their progress most rapid and continuous

The author offers this answer. There are five things that can be done about errors: (1) remove the fear of making errors, (2) stop talking so much about making errors when the aim is increased stroking, (3) talk more about improved technique and better control, (4) stop playing up the number of errors, and (5) give more intelligent instruction on the cause and cure of errors. Combine these quite different answers and the result will be a fairly accurate answer to the question, "What should be done about errors?"

Long experience and years of study have brought typing authorities to the conclusion that the problem of errors should be treated from the broad view that most errors are in technique. This includes many items that never betray themselves as errors in the typed result, as well as those that do. Teachers must accept the modern point of view that typing skill is the aim of their instruction and that skill is always the product of technique. Their primary aim always should be to improve the student's technique. In trying to eliminate errors, the teacher is dealing only with specific situations requiring the origination, improvement, or fixation of better technique. Each error made by the student represents an individual problem whose cause and remedy must be individually handled. Good technique for making that same movement in combination with others must also be recognized. This means practically a different technique for each situation. The existence of lower-order and higher-order habits and of levels of skill ascending to the ultimate potentiality of each individual must also be recognized. The psychological law should be kept in mind that states that lower order habits are improved more rapidly in connection with efforts to establish higher-order habits than when working at the lower levels, provided the learner is capable of making an intelligent and reasonably successful effort. Both teacher and student must appreciate the value of practicing frequent combinations and words, remembering that all learning is specific and that it is better to develop skill in typing the fre-

quent words and phrases than to practice artificial groups of letters whose only excuse for existence is that they contain in unreal association a series of frequent letter combinations. All these observations apply to error correction, which is only learning directed to a specific end.

It is necessary to mention here the importance of motivation and the teacher's responsibility for maintaining it in a high degree. With motivation the average student will naturally adapt himself to the needs of his strong urge, and he will often learn in spite of otherwise poor teaching, while without it the best student will be handicapped. If the student is so poorly motivated that technique and skill make absolutely no appeal to him, drill, timed tests, and remedial work of any kind will destroy and distort his motivation still farther. So give him material in a form resembling that which he must later face in an office.

It would be difficult to create a table that would exhaust all the causes of error. Likewise, it would be impossible to set up remedial practice that would eliminate all errors made. It is often impossible for anyone except the typist himself to distinguish between some of the errors. For example, only the typist knows whether an error is a pile up or a strike over. Also, only the typist can say definitely whether a technique error is made on the individual letter making or combination level. Yet, these are vital questions and it is futile to attempt to eliminate an error or improve technique until these things are cleared up.

The value of an analysis lies mainly in acquainting the teacher with possible causes and treatments. Over a period of time the teacher may bring each of the probable causes and remedies to the student's attention in an incidental way so that in the end the student will have a comprehensive grasp of his problems which should come as a gradual growth rather than a cramming process. It seems a rather hopeless task for anyone possessed of less skill than 60 words per minute to try to analyze errors accurately. It is probably at about these rates that the ability to type word patterns enters the picture in an important sense. Therefore it does not seem wise to make an error analysis chart a part of each student's equipment and its use obligatory in his daily, or even weekly, routine. This would be especially true during the first year when increased stroking is the goal, but during the second year, it could be intelligently used. Errors and remedial work cannot be

handled as a mass problem. Therefore, some time is sure to pass after errors are made before remedial work is even attempted. This materially diminishes the value of such remedial drills, for the best time to correct a difficulty is at the time it occurs.

The same corrective drill cannot be used for all students, even though the cause of the error seems to be the same. The individual factor enters into this in a peculiar way. Students must understand what is expected of the corrective drills and assume some responsibility for selecting the best corrective drill that he thinks will bring improvement in his work, but the teacher must see to it that the choice of remedial measures is accurate and that practice is intelligently done.

The literature of typewriting has contained from time to time lists of errors and their causes. Whether they are the true causes has not always been proved by research, but by the construction of drills based upon the presumed causes and by the measurement of the effectiveness of the drills in removing the cause, as measured by the symptom, at least something should be accomplished in the development of accuracy. There are several good drill booklets that should prove helpful in the choice of proper remedial drills. It is not possible to give here a list of errors with their probable causes and remedies.

The student's work on the remedial practice should be initiated with interest and enthusiasm born of self-criticism. He must feel that the drills have a personal application for him, and he must realize exactly what he should accomplish by their practice. The teacher needs to observe his students at work, making note of what is seen. Many errors in stroking can be detected by listening to him type, and much can be learned by the technique employed by close observation at a time when the student is not conscious that he is being watched. But observation is not enough. The teacher, as well as the student, must think in terms of skill and how to perform it. The basis of any complete teaching plan must rest upon *how* a typist learns, the *order* in which he learns, and the *best methods* for helping him to learn.

The choice of material for remedial practice is perhaps the most difficult problem. In choosing this, the teacher must not be arbitrary, for the student may have a better idea of what happened to cause the error, and for that reason may know what to do to correct it. Repetition of the phrase, line, or sentence in which an error is made is not always the most effective means of overcoming an error, and yet this might be all the teacher can suggest. One may type a sentence half a dozen

times and find a different error each time, because familiarity may breed inattention. Therefore, it is often advisable to choose an entirely different paragraph for practice. Since remedial practice is so largely an individual problem, it is impossible to be as definite in suggesting material as teachers would like. The first thing is to study the errors made by classifying them, then determine their probable cause, and then seek to improve typing habits by whatever remedial practice or thinking is necessary so that the result will be the development of typing speed with control.

Teach the Student to Check His Work for Errors Checking errors correctly is one of the most difficult problems to handle in the teaching of typing. Many students cannot correct their own work because they are weak in the knowledge necessary for making the corrections, they are also lacking in the power of observation. Beginners especially are prone to overlook errors, because they simply cannot see them. To read material for errors is an entirely different thing from reading for meaning. Some of the causes for this lack of checking ability are carelessness in observing details, inability to spell, fixed reading habits that are not adapted to the work, and, in a few cases, willful disregard of errors in order to improve the results, or grade.

The detection of errors is certainly a most valuable skill, for the better a student's error finding ability becomes, the more accurate his typing is apt to be. The poor error checker is blissfully unconscious of his errors, whereas the good proofreader not only knows quite accurately how many errors he has made, but he also knows what types of errors he is making and, maybe, what caused them. Students may not check their work correctly because their teachers do not teach them how to do so. Telling the student to check his paper is one thing, and teaching him how to do it is another. A student will do only what is expected of him.

It is not easy to get students to check errors correctly. The student needs practice in checking, coupled with all the information needed to do the work correctly. Much depends also on the creation of a psychological situation in which the student sees the necessity for learning to find errors. This should come from a realization of the fact that the job in the business office depends on his ability to see errors. No businessman will assume the role of error checker for his stenographer. In the business office, it isn't how many mistakes a typist makes, but the annoying thing is the number of errors that get through.

the typist's checking The student must be made to realize that finding the error is the first step toward eliminating the cause of the error, yet some teachers seem to think their duty is done when they point out errors

Teachers need not check every line of practice done by the students, for this trains them to feel that they are not responsible for finding the errors The majority of students can soon learn to check their work as well as the teacher, if given the necessary instruction Scientific experiments have proved that 100 per cent error checking is impossible Teachers should not try to be "detectives" who suspect their students of trying to put something over on them Rather, they should be friendly guides and instructors Most students are honest and prefer to be honest The few who may not be will show this tendency in other ways and give the teacher something to do in character building Penalties need not be used for failure to find errors Maintain the attitude that the student wants to mark all his errors, that he wants to continue to improve in his ability to check his work, and that the checking work is a co operative venture between him and the teacher If the work to be corrected is a test, then the teacher only may correct it, or the student may make the first correction with the teacher making the second and final check of the paper Assignment work may likewise be checked first by the student and then the teacher, but most practice work should be checked by the student only

Telling the student simply that he has made so many errors is a meager kind of help, and is dull and uninteresting from the teacher's standpoint Correcting errors in stacks of papers is dull also, and consumes much time Yet teachers continue to correct them because most teachers are conscientious and anxious to help their students Are the time, eyestrain, fatigue, and nerve strain worth while, and does the energy expended really help, or is it largely dissipated? It is safe to say that some of it is useless, because it is often routine instead of intelligent It does not favor the right kind of give and take between teacher and student When a student has a paper returned with a great many red pencil marks on it, his attention is centered on the number of mistakes, and not on what errors were made If he looks only at that number and then puts the paper in the wastebasket, he has not been helped much It is what he does with the paper and what the teacher does about it that matters Teachers should see that this is just what happens with much of their well meaning, laborious work The student

may be a little better off than he would have been if he hadn't known whether he had made any errors or not, but psychological investigations have shown that if a student is not told even that much, he may practice for some time without making any improvement

To aid in the training of students for ability in error checking, William R Foster suggested a test for error checking ability in the *Business Education World*, June, 1938, and in the September, 1938, issue he gave a procedure to show students how good their checking is

In error checking training, the teacher must be mindful of the old saying, "Good proofreaders are born, not made" The teacher should never feel that any student who does not check his errors is a crook in embryo or guilty of gross carelessness The best of proofreaders are not infallible, no matter how serious and well intended they may be

Teach the Student to Erase. For many years erasing was forbidden in the typing class, although it was recognized that it was necessary to make corrections by that method in the business office The possession of an eraser was looked upon with suspicion, and the teacher often became a sleuth in his efforts to ferret out erasures on typed copies In fact, there were two unconsecrated acts in typing during this time—erasing and looking at the keys—each labeled as an evil without a reason why

Then the attitude toward erasing began to change, when a few progressive teachers ventured to teach students to erase before they left the classroom to enter their office jobs Texts included a brief section on the use of the eraser—usually at the end of the book, so that the teacher could use it when desired in the course, or not at all The modern attitude toward erasing recognizes that no human being is infallible and that every typist makes errors occasionally, and so there is a need for the art of making a good erasure Hence, it is necessary to teach erasing procedure in typing

When an error is made, there are five things the typist can do just ignore the error and proceed with the work, remove the paper and start again, strike the correct letters or words over the incorrect ones, cross out the incorrect matter, using the hyphen or x, and then proceed with the typing, or erase the incorrect matter neatly and type the correct Each of these five methods may be all right under certain conditions, but, in most office work, erasing is the only proper way of handling corrections, and the other methods are not tolerated.

The newer attitude toward erasing aims to familiarize the student with the necessary procedure and may tend to develop a desire for more accurate writing or even a dislike of the use of the eraser. There are several reasons for the disapproving attitude of teachers toward erasing: (1) Erasing is apparently a great waste of time. The recognition of this fact caused many experiments to be made to determine how many words could be written in the time it took to erase. (2) Teachers were fearful that students would become dependent upon the eraser and careless writing would result. (3) The erasures are not always neatly made, and the resulting untidiness gives a bad appearance to the work. (4) After an erasure has been made, the teacher cannot tell just what error has been made and remedial instruction becomes impossible. (5) The elimination of the errors by erasing destroys the basis for a grade on the work—there is nothing left on which to grade except neatness and placement, and this may result in too many A grades.

The solution to these five arguments has not yet been found. Teachers quite generally agree on the following points, however: (1) They recognize the need for erasing. (2) They realize the importance of erasing neatly and quickly. (3) They know that students will erase sometimes, whether they are taught or not. (4) They admit that good erasures are perfectly acceptable in business offices. (5) They have decided that erasing must be taught in the typing course but do not know just when.

Since erasing is permitted in the business office, the instruction in erasing should be a part of the typing course, and not left to be learned *after the typist goes on the job*. Neat, effective erasing is by no means a simple process, to be taught only once. The following procedure for teaching erasing is suggested.

First, be sure the student knows the difference between a soft eraser and a hard eraser. The soft eraser is usually a red or pencil eraser. The hard eraser is a white eraser, often containing some grit. Both types must be clean and pliable. The soft eraser should be used on cheaper grades of paper or on thin paper. The hard eraser wears away the paper quickly and is best for heavy bond paper. Some typists remove the surface ink with a soft eraser and then use the hard eraser to remove the rest of the ink. After this, if a piece of paper is placed over the spot erased and the spot is rubbed with the thumbnail or some smooth, hard surface, the fibers of the paper that have been disturbed will be smoothed down, resulting in a neater erasure. The movement

while erasing should always be a stroking action, directed away from the machine. It should not be too vigorous. Pressure wears away the paper fibers rapidly and may cause a hole in the paper. The carriage should always be moved to the extreme right or left, using the margin release, if necessary, so that the litter from the erasing will not fall into the typewriter. This will soon clog up the mechanism of the typewriter and produce trouble. The platen or cylinder should be turned forward two or three spaces, so the point at which the erasure is to be made will be easily accessible. When the erasure is completed, the work should be carefully rolled back and then the letter struck rather lightly. There is always a tendency to strike this letter too hard and thus call attention to the erasure by an extremely black letter. If the erasing needs to be done near the bottom of the paper, the cylinder should be turned backward instead of forward to make the place accessible.

After the above procedure has been taught and practiced several times, the teacher may proceed to more complex things, like the use of the celluloid erasing shield (a card or piece of paper may be used if celluloid shields are not available), erasing and making a correction on a paper that has been taken out of the machine and doing it as well as if the paper had remained in the machine, expanding and contracting (spreading and crowding) the correction, that is, typing a three-letter word in the place of a four letter word or inserting an omitted letter in a word.

Erasing on carbon copies presents a different problem. Slips of paper must be used. The erasure is made first on the last carbon copy, then a slip of paper is inserted at the spot, and the next to the last carbon erased upon, another slip of paper is inserted, etc. When the erasing process is completed, the slips of paper must be removed. In turning the copies forward in the machine, care must be used not to shift any of the sheets.

These different kinds of erasing may be taught at whatever time in the course the need arises. It would be best not to teach them all at once. If a one semester personal use course is being taught, then they should be taught at or near the end of that semester. The exact time for teaching erasing in the regular courses of typing is still debatable but the author believes that erasing should not be taught until the student has developed considerable continuity of writing, because stopping to erase interrupts the flow of writing. Therefore, teach it during the second semester, with a limited opportunity to use it. With the voca

tional students of the second year, the erasing procedure should be as well perfected as is possible for each student. The prospective business student should be able to make corrections that are not noticeable

The Relation of Accuracy to Speed. Accuracy and speed are essential elements of skillful typing, and the typist's ability to sustain them is the measure of his typing power. Accurate writing is controlled writing, whether fast or slow. It may contain an occasional error, or it may be without error. Speed is not just fast writing but is a continuous flow of power for long periods of time. It is characterized by ease, poise, control, and continuity. Fast, controlled writing is fluently done.

Never allow accuracy emphasis to get in the way of speed development. Teachers use the word "accuracy" too much, and with "pressure-like" emphasis, when they might talk about more careful reading and stroking or controlled writing. It is not accuracy that is condemned, but its exaggeration, and for the reasons that it is overstressed at the expense of fast movements and gives a distorted view of the essentials that make skill.

It would seem, then, that speed and accuracy are not highly informative terms and, consequently, are not very reliable as mental guides to greater typing skill. The skillful teacher of typing knows when to "play up" one or the other and never allows them to get out of balance, for he realizes how dependent each is upon the other.

CLASS DISCUSSION QUESTIONS

1. What things produce control of writing?
2. To what extent is muscular control dependent on mental control?
3. Which is the greater problem for the teacher, to develop the student's rate of writing, or to develop the control necessary for accuracy? At what points in the course should these things have emphasis?
4. Compare the attitude of the early texts and the modern textbooks toward accuracy.
5. List as many things as you can that will cause errors, and group them as mental and motor elements.
6. Set up the best arguments for and against the use of error analysis charts.
7. Discuss the remedial treatment of errors. Whose problem is it, the teacher's or the student's?
8. How can a teacher best interest his students in studying the cause and the remedy for the errors they make?
9. Of what value to the student is the requirement that he check his own work before the teacher checks it? Of what value is this requirement to the teacher?

10. Should teachers penalize the student for errors he fails to check? If not, why not? If so, what should be the student's penalty?
11. Compare the accuracy requirements of the high school typewriting class and the business office.
12. Evaluate the requirement of perfect work in typing classes
13. What is wrong with the traditional theory that accuracy should be developed before speed?
14. Justify the theory that speed and accuracy should be developed simultaneously.
15. Justify the argument for teaching erasing early rather than late in the typewriting course
16. How should the student determine how many times he should practice each word in which he has made an error?
17. What are the advantages or disadvantages of requiring a student to write five lines of each word in which he has made an error?
18. What are the best arguments for providing a great deal of practice on the commonest words during the first semester?

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CHAPTER XI

Speed and Its Development

What Is Speed? Students in typewriting are speed minded. This natural impulse to write rapidly is apparent from the beginning. If curbed too much, then, the learning may resolve itself into a mode of operation far inferior to the learner's possibilities. Students never want to become slow typists, therefore, teachers need not overuse the word "speed." They should talk about skillful operation, making sure that the student knows this means fast stroking, right habits, correct techniques, mental control, etc. When the teacher uses a limited vocabulary with beginners, monotony (an enemy to skill development) is the result. The teacher should choose a vocabulary of meaningful expressions that will enhance the practice efforts of the student. For years many teachers attached an explosive effect to the word "speed" and feared to use it, except negatively, especially with beginners. Now it is used more liberally and with a much broader interpretation when they talk about "speed with control" or "speed with precision," as contrasted to the old expression, "speed with accuracy." Typing specialists use a still broader interpretation when they talk of "sustained skill" or "typing power."

Then, what is speed? Book, the psychologist, says: "It is the development, perfection, and use of higher order habits that give to a typist his effective speed, and the chief task of a teacher is to see that these necessary habits are developed and fixed in the most effective way." According to Dvorak, speed consists of calm, controlled, unhurried, easy typing based on correct motions, and correct motions, he says, are simple, fast, smooth and rhythmic, calm and unhurried, relaxed and pleasant. To the author, speed means the rate of writing that a typist can consistently maintain for long periods of time, on new material, with ease and control. This means really sustained skill and may be

measured in gross, or net, or correct words per minute. Lesser efforts are attempts at speed. Experimental tests have shown that a typist must write for at least three minutes before his speed can really be measured. Shorter tests are, then, just spurts of speed, and, while they have value, if used properly in speed training, yet they are often confusing because they are the result of tense, forced effort that cannot be sustained. To the question, "What is sustained typing skill?" Harold H. Smith says "An oversimplified answer is that sustained typing skill is skill that is capable of being maintained in a steady fashion without much, if any, variation."¹ He explains his answer by saying that the first requirement of any human being called upon to perform "steadily" is that he shall work at a gait somewhat below his fastest gait. A quarter miler runs at a slower pace than a hundred yard dash man, a marathon runner slower than a miler, and so on. Otherwise, they would "burn themselves out." It is so with typists. Speed is not dependent upon hurry, but rather upon control—the ability to be indifferent to the surroundings and to preserve continuity of stroking. Speed is the natural outgrowth of proper techniques that have become habits, of right attitudes that have been formed, of controls (both mental and physical) that have been learned, and of much practice that has been intelligently done.

The Growth of Speed. Speed in typewriting has increased until the experts of today can write almost twice as fast as did Miss Rose L. Fritz when she won the first national championship in 1906, with a speed of 82 words per minute. This remarkable increase has been due to a better understanding of speed development, to more careful and intensive training of the operators, to the selection of operators better fitted for the training, to constantly improved methods of training and, finally, to admitting for competition the electrically operated machine, which, naturally, is capable of higher speeds than the manually operated ones.

Prior to 1906, there was much confusion as to who was the world's champion typist and what constituted the world's record. In 1906, official contests were first organized in the United States. A \$1,000 silver World's Professional Trophy Cup was offered in 1907 through the co-operation of the leading typewriter companies and the *Office Appliances* magazine. The contests continued under the support of the typewriter companies and business show managements until 1930, when

¹ Harold H. Smith, "Training Routine for Typists"—No. 2. "Sustained Skill Development." *Business Education World*, January, 1940.

they were discontinued James N Kimball was officially in charge of the contests, at first assisted by a committee of educators but in complete charge from about 1912 on. Much credit is due Mr Kimball for his untiring efforts in promoting this International Typewriting Contest, which gave the typewriting profession many experts who have contributed much toward what is now known about speed development. Mr Kimball also had a large part in the development of the International Typewriting Rules, which gave a unified basis for checking typing work and calculating speed writing.

Through these years, several typewriter companies organized departments in which aspirants were trained. All were paid for this training and for the public demonstration work that occupied most of their time. The International Typewriting Contest was made up of three classes of contests according to the training and experience of the contestants and to the length of each test. The highest class was the Professional Contest, a 60 minute event open to all the winner of which was declared the World's Champion Typist for the next year. The Amateur Contest, a 30 minute event, was open to anyone who had not won an international amateur contest or competed in a professional contest. The Novice Contest, a 15 minute event, was open to anyone who had not touched a typewriter prior to August of the year preceding the year of the contest. In the late 20's a school class was added to permit school trained typists to compete with one another without having to meet the company trained novices.

The interest in typewriting contests waned somewhat after the International Contest was dropped in 1930. Teachers had become too content minded, training students who knew little beyond straight copying speed and spending most of their efforts on the gifted students who showed promise of winning a contest. The demand for skill building had its birth about this time because business required more than just straight copy work. Some contests began to include tests on setting up business letters, doing rough drafts along with the test for speed. Teams of students were pitted against each other giving a greater number of students a chance to compete. When the International Contest was discontinued in 1930 Mr Kimball sent out a letter of announcement in which he said

Designed originally to place typewriter operation on the highest possible level it has unquestionably accomplished its purpose and thus having accomplished what it set out to do there is no longer a logical reason for its continuance.

In 1933, a committee headed by William C. Maxwell, of the Hinsdale (Illinois) High School, organized the International Commercial Schools Contests. These contests dealt with a wide variety of business skills and were organized into many classes according to the type of school and the length of each contestant's instruction. A few contests, such as certain ones in typewriting, were open to all. These contests were held until 1941, when they were dropped because of the war, were resumed again in 1946, and were permanently discontinued after the 1947 contest.

Contests still enjoy a limited popularity among the schools of the country and probably will continue to do so because the spirit of competition will never die. There are those who believe the contest has had its day, but, be that as it may, the contest served a purpose and served it well. When schools began to hold contests, a teacher who could train students to write 40 words per minute by the end of a year of instruction was an outstanding teacher. The contests raised this rate decidedly, and, since they were dropped, improvement in speed training has continued until the businessman of today can expect 50 words per minute as an average. Without the support of the typewriter companies, it must be recognized that there would have been no contests and therefore no steady improvement in typing skill over the years. This improvement in the skill of the few has been reflected in an improvement of the skill of the many students and office typists throughout the United States.

It is unfortunate that there is no impartial, official supervisory body comparable to those conducting athletic events of all kinds. Like athletic contests, changes have been made from time to time in the eligibility and contest rules. In order to force greater emphasis upon accurate typing, the penalty for errors was raised from 5 to 10 words, in 1918. This change actually resulted in an increase in gross speed in subsequent contests. Before 1906, the penalty for errors varied from none to "one word off" for "material" errors to "3 words off." Because of the varying difficulty of contest material, which threatened to make further improvement of speed records impossible in the early 1920s, an attempt was made to standardize the material by arbitrarily fixing five strokes as the length of the "standard word." This meant four characters and the space stroke. Prior to this change in 1924, speed was calculated in terms of actual-count words. No one has succeeded in setting up a satisfactory measuring stick for determining the difficulty of copy material in typing, although the five-stroke word was a step in the

right direction Mr Kimball prepared more material for typing tests and contests than any other person and was most successful in it Since 1931, copy has been prepared by many other sources They have succeeded generally in making it much easier by reducing the number of sentences, often at the expense of good English style, by reducing the number of shift and special characters, and by reducing the number of double letters and double spaces after sentences Such changes in rules would not be tolerated in sports or athletic contests, but in this way the typewriting contest rules were evolved from a few lines in 1907 to the present form in 1926 Several changes should be made in these rules, but to date no one feels he has the authority to do it.

It is impossible to give the results of these recognized contests An excellent summation was made by Harold H Smith and published in the *Business Education World*, January, 1945 Students are usually interested in champions and thus will always want to know who is the champion, if there is one, and what is the best speed ever made It might prove interesting to them to know some facts about what has been done

1 The winner of the first typing contest of which there is any record was Frank McGurran, with an approximate speed of 96.5 words per minute in 1888

2 The winner of the first official contest was Rose L Fritz on the Underwood, in 1906, with a speed of 82 words per minute She is considered the first World's Champion Typist and held that honor for four years

3 The best Novice record was made by Hortense S Stollnitz, on the Remington, in 1915—114 words per minute (5 word penalty)

4 The best Open Novice record was made by Helen M Sayer in 1941, on the Electromatic, in a 20 minute contest—129 words per minute

5 The best Amateur record on the manual machine was made by George L Hossfield, on the Underwood, in 1917—145 words per minute (5 word penalty)

6 The best Amateur record ever made was that of Margaret Hamma in 1941, on the Electromatic—149 words per minute On the same day she won the Professional Contest

7 The best Professional record up to 1930 was made by Albert Tangora, on the Underwood, in 1923—147 words per minute (10 word penalty)

8 The best Professional record ever made was Margaret Hamma's in 1941, on the Electromatic—149 words per minute

9 The highest speed for one minute was made by Margaret B Owen on the Underwood in 1918—170 words without error (actual word count)

10 The best Open Portable record was made by Cortez W Peters on a Royal portable, in 1941, in a 20 minute test—115 words per minute

The above information contains the names of some of the best typists the profession has produced. Others that participated in these contests and might well be added to the above list are Charles McGurrin, Florence E. Wilson, Minnie Regelmeyer, Genevieve Maxwell, Stella Willins, William F. Oswald, Barney Stapert, Chester Soucek, Arthur Neuenhaus, Grace Phelan, Norman Saksvig, Glenn Kingsbury, and Stella Pajunas. The World's Championship has been won more times by George L. Hossfield than anyone else can claim. The most accurate record can be claimed by William F. Oswald—eight errors during an hour of writing and with seven of those errors neatly erased by special permission before the contest—speed 129 words per minute. Of the women typists, Margaret B. Owen and Hortense Stollnitz have been outstanding, and the achievements of Margaret Hamma on an electrified typewriter are also worthy of note. The advent of the electrified typewriter has raised many arguments as to the propriety of pitting operators of electric and manual machines against each other. It seems desirable that separate records be kept of the official records made on the two types of machines.

What Characterizes the Expert? The expert in any field is the person who reacts more rapidly, more precisely, and more comprehensively to the problems imposed on him than do other contestants. It is a commonplace that experts typing from 40 to 80 words a minute appear to work much more effortlessly than ordinary school typists and office typists at the same rates. The experts' explanations of their records are usually made in such general terms as "continuity," "keeping the eyes on the copy," "rhythm," "concentration," "good technique," etc. Nearly everyone has come to accept these as accurate and adequate explanations of the phenomenon of effortless, yet skillful, typewriting. These explanations have not served well in guiding teachers and typists, simply because they are so abstract and fragmentary as to be of little use in helping the learner in his struggle. There is experimental evidence that the expert has perfected his technique by organizing such superior responses of mind, eye, and hand that, if he chooses deliberately to space out his typing strokes and motions, as he can do in typing from 40 to 80 words per minute, he can actually relax more completely and for obviously longer portions of each interval between strokes than the student can rest, if he rests at all. To say that the expert possesses better technique than the student is true but does not help the student. If the student is told that each of his typing motions is too slow, too

weak, too uncertain, and is shown how to improve these motions, then he might have a chance. Teachers must understand each thought, each action, and each important factor that constitutes good technique. Then they will have something specific to teach, although constantly confronted with the problem of how to present each skill item and how to insure its mastery by each individual student.

It should also be noted that deliberate variation of stroking speed is far greater with the expert typist than it is with the less skillful. This ability accounts for the greater accuracy of the expert typist, lack of it, for the greater inaccuracy of the unskillful typist. Whereas the expert adapts his stroking rate to his feelings of the moment, to the needs, and to the fingering difficulties met, the average student and office typist must hope that he can drop into his normal working rate—a rate that he cannot define, describe, or demonstrate, as a rule. If he is forced to hurry more than usual or if he tries to work slowly because of some real or imagined difficulty in the job, he finds his meager skill inadequate, he is slow and full of errors. He is the slave of poor typing habits and subject to disaster at any time. It is true, however, that as long as typing proceeds on the lowest level of one character after another, the stroking rate is sure to be slow, with little or no appreciation of the meaning of the material typed. Beginners working on this lowest level must be expected to make many English and spelling errors, particularly in direct dictation to the machine and in transcription work. But there is as yet no recognized way of identifying the moment when the typist departs from the isolated stroking level and advances to the combination level.

It is known, however, that no one operates on the combination level exclusively. Because of the tendency of repeating certain common combinations, like *de*, *ing*, *tion*, in the same pattern early in one's typing experience, it is safe to suspect that automatization takes place fairly early and after a sufficient number of repetitions. Even with students who have had two or three years of instruction, it is difficult to identify some of these tendencies, because there is so little difference between the rate at which they type these combinations and the rate at which they type the rest of their work. It is true that, whenever the inexperienced typist reads too much for meaning, he often confronts difficult combinations that result in typing errors, if he does not stop, readjust his attention, and proceed under conscious control. Both these results are accompanied by hesitations and stoppages that force attention away from the

meaning The typist who has not developed skill in the control of his attention cannot type with smooth continuity The limit in any skill cannot be reached until the whole operation and all its parts function with smooth continuity.

Through lack of energy to practice, except when compelled by the nature of their work, few typists reach their maximum speed, while many have little more than the skill actually required in their daily work To gain expertness, work that increases in difficulty must be faithfully done External disturbances like fear, anger, excitement, etc., have little effect on expert typists, but it is not unusual to see a beginner sweating profusely in a cold room from the exertion of a simple test

Only when all the necessary habits, high order and low order, have become automatic, does one rise into the freedom and speed of the expert Rapidity means the wielding of larger and more complex units The smaller units have been so mastered that they are swallowed up in the larger Therefore, learning to typewrite rapidly and accurately means the mastery of a number of skilled motions that call for great speed and deliberate precision, as they are interwoven in ever changing and intricate patterns When one realizes that typing at 60 words per minute means five separate finger strokes per second, and 120 words per minute means ten finger strokes per second, in addition to doing all the other things that constitute typing skill, it is clear that the expert typist is capable of very fast motions Then when one realizes that these motions must follow in varying, but absolutely specific, order, it is obvious that a skilled typist is capable of precise, closely timed, and specifically selected motions

Typing page after page without error, with the eye kept on the copy, represents genuine progress in the mastery of typing skill Skill consists largely in the elimination of unnecessary or waste motions The novice tenses his back, screws up his face, writhes in his chair, to type continuously for half an hour exhausts him The expert, having eliminated superfluous motions and bodily tensions, keeps the same pace hour after hour, with relatively short rest pauses This characteristic ease in 40 velocity of skillful performance is well illustrated by August or about Nellie Merrick in "Correct Typing Motions" (*Business Student World*, April, 1937) Good form is a common attribute of the student person sit down in front of a typewriter and insert a sheet

of paper to distinguish the novice from the expert Grantland Rice says "If you can't play like a golfer, at least try to look like one" How true this is for the typist!

Essentials for Speed. Speed will not result merely through the passage of time, the striking of keys, or the employment of mediocre training methods It requires a combination of the best possible methods of both learning and teaching and the utilization of the best possible practice matter, with the most economical use of every second of time and effort

Many interesting things have been written about speed and the essentials for its development, and typing authorities have set up varying lists of factors necessary for skillful operation of the machine Teachers may read all this material and yet feel that they need a few definite things to check by, even though some of them may be a bit intangible The things most talked of in this respect are (1) physical fitness, (2) correct posture, (3) a knowledge of the keyboard, (4) proper technique, (5) smooth, even stroking, (6) quick, snappy, but precise key stroke, (7) efficient fingering ability, (8) continuity of writing, (9) ease of operation, (10) ability to relax, (11) elimination of waste motions, (12) mental control, (13) co-ordination of mind and muscles, (14) motorized vocabulary, and (15) willingness to work. A brief explanation of each should aid in making use of them In addition to these, there are many personal traits that improve or retard the student's speed development These have been discussed earlier sufficiently to show their influence

Physical Fitness Energy is necessary to typewrite, so one who lacks in physical energy will find difficulty in becoming a skilled typist. Nerves must be steady, eyes must be good, fingers must be dexterous and sufficiently long, and the brain must be capable of functioning adequately

Not enough attention is given to the physical fitness of typing students The teacher should watch for telltale signs of fatigue as reflected by the face and eyes of the student Even the diet of typing students is important, for undernourished students lack energy, and heavy eating at noon will make a slow afternoon typist, just as an inadequate breakfast will affect the morning typist The high strung jittery student must learn to settle down to calm, controlled effort, because typing demands the highest type of nerve control and nerve reserve Teachers must understand the influence of physical elements

Correct Posture Efficient control cannot be exercised if the typist does not assume a bodily position that will permit his nerves and muscles to function freely. If the expert does not feel right as he sits before his machine, he knows he cannot type right. The would be typist should learn as soon as possible that his position should *never* vary from day to day.

A Thorough Knowledge of the Keyboard If high speed is to be attained, each finger must have certain definite keys to control and must know where those keys are located on the keyboard, or else haphazard operation will be the result. Hesitation is an enemy of speed and produces reach and substitution errors. The keyboard may be considered mastered when the student knows the positive location of each key, when the student is positive with which finger each key is struck, and when the student has acquired the ability to find the keys instantly.

Proper Technique The growth of fast, accurate typing results from the automatization of proper technique, in fact, the development of typing speed is synonymous with the development and habitual use of technique. At whatever rate the technique breaks down, the increase in writing rate ceases. Fast typing is calm and controlled because its basis is correct technique.

Some teachers seem unable to convey its full meaning to students, and students often are not impressed with its importance. There are so many new, interesting things to be taught and learned at the beginning, when correct technique needs its major emphasis, that its emphasis may often get lost in the maze of things to be learned.

Smooth, Even Stroking Even stroking results from proper timing of the key strokes. To many, "smooth, even stroking" means rhythm. There are really two kinds of rhythm in typing—absolute rhythm and approximate rhythm. Strictly speaking, absolute rhythm is never attained, because it is impossible to do such mechanically perfect timing as that would require. It is something to strive for, however, especially in the early learning stages, because from it approximate rhythm develops. By "approximate rhythm" is meant the slightly varying or changing rhythm of rapid writing caused by the inherent difficulties of fingering, etc. Hard combinations in practice material may be compared to the hurdles encountered by a hurdler in track athletics. Just as a hurdler must approach the hurdles and clear them with a slightly different stride than he uses in covering the space between hurdles, so must the typist finger the difficult combinations with a different rhythm than

he uses in negotiating the evenly balanced combinations. Unlike the hurdles in a hurdle race, the different combinations do not occur at regular intervals. When the hurdler loses his stride, he knocks down a hurdle, and when the typist loses his timing, errors occur. The mind must be trained to watch for the difficult combinations, to guide the fingers through their movements with as much rhythm as possible. The experts have a tendency to slow down gradually in approaching difficult combinations and then as gradually pick up speed after negotiating them, thus trying to prevent a sharp break of the stride or pace.

Whatever time is needed for each stroke must be allowed for it, then the next stroke should not start prematurely, or the whole movement will be thrown out of time. The mechanics of the typewriter require a finite period for each part to respond. The human mechanism requires a finite period for motivating each part of the typewriter. The total time required for a complete key stroke is the sum of the time required by the machine and the operator. Any attempt to start the next stroke before that combined interval has elapsed means timing difficulties and trouble. The typist may vary the tempo of his stroking, but he must give each stroke its time, and that time must equal or exceed the minimum required for the combination of the machine and the operator. Thus, the need for approximate rhythm is evident. If the student has a real sense of timing, he can make the transition from absolute to approximate rhythm and keep his stroking "smooth and even", otherwise, he will need a great deal of demonstration and explanation from the teacher.

Quick, Snappy, but Precise, Key Stroke Authorities have invented 'catch phrases' to describe the key stroke. Expert typists, who can stroke the keys correctly, have very little idea of exactly how they strike them, and their attempts at explanation are sometimes wrong. On one thing they agree—they know that the keys must be struck quickly, with a snap back or getaway that has been described by very different terms, but all meaning the same thing practically. Because there is no language of the motor skills, these attempts to describe the key stroke have been clumsy. The student's efforts to comply with what he understood of these descriptions have not always been helpful, because the teacher's idea of the correct key stroke may have been wrong to begin with, and, if it was right, the student may not be able to translate the description into terms of his motor reactions.

Efficient Fingering Ability If high speed is to be attained, there must

be efficient fingering ability That is axiomatic in typing and has been recognized for years Each finger must be kept near the keys that it controls, ready to strike any one of them without hesitation or delay The nearer the finger is to a key, the shorter distance it will have to move in striking the key and the more quickly it can make the movement required. The movements of the fingers must be as independent as possible of the body of the hand. Hand movement slows up the process, while finger movements, independently performed, produce fast, accurate strokes The muscles of the hands and fingers are so arranged that, when any one finger is moved, there is an involuntary tendency to move the other fingers also This interferes with finger control and is the thing that must be overcome, if the fingers are to move independently of each other

The typing student needs some daily intensive finger practice, which should give him the fingering ability needed for the skillful hurdling of all kinds of obstacles Without such intensive practice, he must slow down to less than his best speed whenever he meets such difficulties Then he will merely be practicing his previously learned slow responses and fix them as habits It is because most typists have never made such intensive practice efforts to increase the capacity of their fingers that their technique is bad, and this is what has prevented them from becoming skillful typists

Continuity of Writing The expert typist is distinguished as such very largely by his ability to write continuously for long periods of time, without hesitation and uncertainty Continuity is an even flow of writing, which keeps the carriage moving line after line Training in continuity should begin with the first stroking efforts It is continuity that piles up the gross words on a speed test. Spasmodic writing takes more energy and gives less to show for the effort expended

Ease of Operation No one can doubt that the expert works with an obvious ease and lack of effort entirely beyond the ability of the novice This effortless ease may be called "relaxation," but it is really well placed rhythmic effort. The well placed, perfectly organized skill may call for considerable muscular energy, but all the energy goes in the right direction, none is dissipated in wrongly directed movement There is no forcing, no working of one part against another

Speed and accuracy both flow from the same source—properly placed internal control and an organized flow of rhythmic effort. When this is established, there is ease of operation. When the typist thinks of noth

ing but perfect accuracy as an end in itself, his very anxiety becomes an obstacle to ease of operation. Likewise, when he pushes too hard for speed, beyond his control, not only will his accuracy suffer, but ease of operation is lost. Ease of operation is greatly aided by a knowledge of the keyboard, by a sureness of the manipulative processes of the machine, and by confidence in himself and his ability to learn.

Ability to Relax Relaxation is something that is learned. Merely telling a person to relax is like telling him to be skillful. The power to relax must come to him through practice, and it must grow with practice. This is one of the most important outcomes to have in mind in the teaching of a skill like typing. The typist, therefore, must learn what parts of the body to relax and when to relax them.

Elimination of Waste Motion The expert typist uses simple, economical motions, uses less energy, and makes every movement count. To be expert, all unnecessary and wasteful motions and bodily tensions must be eliminated. Every movement necessary in the operation of the typewriter must be performed in a minimum of time and with as little effort as possible, if speed is to be attained.

Mental Control In training for speed, the typist should early be made to recognize the importance of keeping his mind on his work. The mind must absolutely control every phase of the writing. Great musicians have long recognized the importance of mental control and the effect of mental distractions. Experts have learned to appreciate this, but the average novice still has the lesson to learn. Many errors may be eliminated by a more complete degree of mental control.

Typing develops mental alertness and the ability to concentrate. If the mind wanders for only a fraction of a second, concentration is lost, because mental control is gone. If ever a typist passes the 40 word per minute level, he must acquire some idea of what is meant by mental control. There is a difference in the quality and nature of mental control at various stages of skill development. In the beginning, the attention should be directed to a thoroughly detailed picture of each separate motion before it is made. Later, when the position of the keys has been mastered, when it is no longer necessary to hesitate over the return of the carriage, the attention should be fixed upon maintaining a uniform, positive blow, and on keeping up the desired rhythm or timing between strokes. Still later, at about the 70 word per minute level the attention may best be turned toward the phases of general caution, the mind watching for difficult combinations, guarding against

temptations to slur keys, and also acting as a pressure gauge to keep up sufficient nervous and physical pressure so that no time may be lost, and so that the touch and general appearance of the work may be uniform throughout.

If the importance of gaining mental control is recognized, it is surprising what an impetus is generally experienced in typing. The mere recognition usually suffices to raise the individual's speed and accuracy immediately, when comparatively little time has been spent in perfecting this control, the improvement will be most marked. As an aid in conquering the many details of technique, intelligent mental control has no equal.

Co ordination of Mind and Muscles Since the mind is in a position to direct the muscles, it follows that there must be co ordination between the two, else there can be no skill. Persons who have worked much with their heads and little with their hands may be lacking in this ability to co ordinate. This explains, sometimes, the failure of the high I Q student to develop typing skill. The deficiency cannot be recognized on sight, only the "trial and error" will tell.

Muscular control is as important for speed and accuracy as mental control. Its importance must be recognized from the outset of the learning, if bad habits are to be prevented. To attain it requires persistent and patient practice until each thing can be done correctly and rapidly through habit.

Motorized Vocabulary Automatic typing is essential for ultimate success in typewriting, and this fact means that it is necessary for the typist to develop a store of words, the motion patterns of which can be instantly recalled when the word appears in the copy. These action patterns are easily developed by some typists and may never be developed by others. Dvorak says automatic typing is possible only after rates of 50 to 70 words per minute have been reached and held. Some authorities will make no effort to fix a speed to mark the point where it begins. Others have expressed the idea that, without a motorized vocabulary, the maximum speed a typist could expect would be around 40 words per minute. Be that as it may, this is known: a vocabulary of words that can be written automatically is essential for skill in typing, and the larger the vocabulary, the higher the speed that can be expected. Experts have such large motorized vocabularies that only a small per cent of their typing need be done on the unit level. When the typist has made the transition from the unit phase to this automatic

phase of skill, his typing process is no longer clumsy and awkward but is made to seem easy and comfortable

A motorized vocabulary is a necessity. It can be developed by practice because frequency of use and ease of execution determine the words to be motorized. Therefore, the commonest words will be the ones to be motorized along with common sequences of letters, prefixes, and suffixes that make up the large part of long words. In order that speed may be developed more quickly through the early building of a motorized vocabulary, the modern textbooks in typewriting use the commonest words in the keyboard exercises. Infrequent words, such as those found in alphabetic sentences, aid speed only by the finger training they may give.

Willingness to Work. The student must have an intense desire to acquire speed, so he will be willing to work for it. He must co-operate with the teacher, willingly accepting his guidance and help. He must study his own learning problem faithfully, adding his findings to the knowledge and experience of his teacher. He should have a goal toward which to work, even though it is unattainable, for it will provide an incentive to work. Without this willingness to work on the part of the student, the teacher may be helpless, no matter how capable he may be or how well he may understand his problem.

The Need for Concentration. Since the typist's mind is his guide to improvement, what he is thinking about every second of his practice is of paramount importance. There is little the teacher can do to aid the typist's learning that does not have some influence on the typist's trend of thought while practicing. Typists often sabotage their own work by making themselves think they are concentrating properly, when really their minds are on something else, such as, "I wonder if I made an error," or "Should my bell be ringing?" and many other queries. Such distracting thoughts only mislead the student and make him believe he is concentrating. He is not concentrating on the copy or on the direction of his specific mental and physical responses, but rather on many extraneous matters that naturally intrude to disperse his mental and physical energy and make his effort unfruitful. These worthless types of concentration are at the root of many typing errors and of much poor technique that has often been charged to other sources. Hazy thinking is one result of faulty concentration. The impulses from the nerve centers become confused, distorted impressions are sent to the hands and fingers, and the results are transpositions, omissions, addi-

tions of strokes, uneven, spasmodic writing Many typing errors that have been attributed to lack of finger control, lack of co ordination, nervousness, etc., are really poor concentration or lack of concentration

Teachers should bring this truth vividly to their students, in order that the student may fully understand that faulty concentration is the real reason for so many of his typing faults Obviously, if the student is always concentrating on the right thing, he will make the maximum progress Therefore, one of the teacher's greatest problems is to find out or help the student discover what phase of the typing process he should be concentrating on at each stage of the learning and for each type of drill that he practices Every successful teacher of typewriting is continually seeking motivating devices to keep the student's mind actively directing his work In addition to providing incentives for active mental participation during practice intervals, teachers are striving to make certain aims paramount in the typist's mind, so that his mind will be not only a forceful leader but an intelligent guide Of course, it is true that the student will learn by "trial and error" to discard thoughts that do not seem to aid his progress and to cling to those that seem to be more effective But if the teacher were able to tell the student just what he should be thinking about during each drill, and if he knew how to use incentives to make this thinking forceful, then the student should be able to make much greater progress than by relying solely on the "trial and error" process of learning

Anything that causes one to break proper concentration on the copy and on the typing operation contributes immediately to the making of errors The train of concentration is broken much more frequently than most individuals realize It is difficult to maintain the quality of typing during the beginning and close of a train of concentration, and it is impossible to improve skill at such times Much can be done by observing simple rules of concentration A set of rules that seem pertinent to the development of continuous, correct concentration was given in an article in the *Business Education World*, October, 1943, "Continuous Concentration While Typing," by E C McGill and Harold H Smith

Proper concentration calls for a certain readiness and ability to change the direction of the attention from one essential thing to another as the typing operations require, always shutting out, as effortlessly as possible, extraneous ideas and sense impressions It is a vital skill within a skill One of the most important aids for the development of expert

skill in typing is continuous concentration of the right kind, for that will produce a relaxed, steady, and confident typist

The Importance of Reading the Copy. Scientific analyses of the reading process have completely revolutionized reading theory since the close of the nineteenth century. It is now recognized that school success or failure depends largely on the individual's dexterity in reading. When these students enter a typing class, they can read from the printed page, orally or silently, at 100 words a minute at least, with most of them reading 150 to 300 words a minute. Their reading background began ten or more years before and is continued as long as diverse experience adds new reading, new vocabulary, or enrichment of vocabulary. Regardless of how reading is taught, the high school student has a spelling knowledge and a fairly wide recognition vocabulary of 8,000 words or more. The vocabulary of the modern typing text offers little difficulty for the typing student, since it is based upon common words in ordinary use arranged in different patterns of meaning. It is safe to estimate that some students will improve their reading patterns because of the known aid that typing gives to the reader who is deficient in word recognition and spelling.

There are two types of reading. One type is reading for ideas or thought content, never thinking of the details of construction. This is fast, pleasant reading. The other type is reading for accuracy of detail, seeing sentence structure, as well as getting the thought. This necessitates slower reading. In typing, accuracy of detail is more important. Many individuals type well without knowing the content of the material they have written. When students begin to learn typing they have been reading most of the time for thought content, so when they begin the formation of habits that create typing skill, their reading rate must suddenly be brought down to the level of their finger reaction skill. Thus, the reading rate will be very slow at first and must always be kept in check. Because of the processes involved in typing, the rate in typing will never equal the reading rate. If the student attempts to bring his reading rate to a level with finger reaction skill, he may experience no difficulty, but, if he tries to bring his finger reaction up to a higher level, then one or more false strokes will occur. Most errors involving more than two false strokes are caused by misreading the copy. Reading errors in typing include anticipation of letters or words, deviations from the copy in punctuation, paragraphing, and capitalization, omission of words and parts of sentences, insertion or addition of

extra words and phrases, and substitution of a wrong word or a phrase for the correct one. Since these errors originate outside motor adjustments and do not involve any defect in motor adjustments, they may be thought of as giving the typist the greatest difficulty.

The task of the student in learning typewriting is to read the copy to be written and to transfer it letter by letter on the machine by striking a certain key with a certain finger for each letter to be made. To this task, the learner brings his ability to read and to understand the copy, his ability to spell the words he writes, and his ability to make the movements required for striking the individual keys of the typewriter. The student must acquire the ability to read the copy correctly while engaged in initiating, directing, and controlling the correct sequence of finger movements required to make each letter at the proper time on the machine. Thus the reading of the copy must keep pace with the finger reactions in making these letter making movements. This involves three separate processes, which Book says the learner performs differently at different levels of skill: first, reading the copy, second, initiating of several letter making movements to be made, and controlling these movements as to sequences so that the typewritten words will be accurately spelled, and, third, accurate automatic location of each key by the appropriate finger as a part of the striking process. In the beginning, each letter may be pronounced by the learner before and while it is being struck on the typewriter. Many teachers seek to accomplish this reading control by means of dictation by the teacher, by some student, or by teacher and students spelling together. This sets the reading pace for the students. Later, the letter making movements are initiated and controlled as to sequence by attentively reading each letter in the copy while the key is being struck. Merely reading the letter in the copy at this stage sets off the appropriate letter making movement. Still later, when the writing is so fast that the letters cannot be read one at a time, a mental spelling is required to control the letter making movements. In the expert stages, the sequence of these movements is controlled by group reading and spelling, which enables the learning typist to control the sequence of these movements by groups.

While the students are learning to read at a lower rate, they are also learning stroke control and are thus gaining a co-ordination between eye, mind, and fingers. As stroke control develops the time between the strokes diminishes, some of the movements needed at the lower levels are eliminated, the writing rate increases, the reading rate keeps

pace with the writing rate, and the accuracy is not impaired. When the striking of the keys is not under perfect control, or when there have been errors in reading the copy, errors in stroking will occur. When this happens, the student should be able to recognize such errors in his typed copy. He has been reading for thought content and not to see words in themselves or to observe details, hence he may not see all his errors. He can be helped with this difficulty by the teacher's reading aloud distinctly and slowly the material that was just typed, the student checking his copy. This procedure may be varied by sometimes having a student read aloud from his typed paper while the rest of the class check and the teacher follows the copy. Thus, students may be brought to regard the proofreading of their work as a part of the learning of typing, and materially lighten the load of paper checking for the teacher.

It is universally recognized that in reading any differences in purpose and types of material change speed, comprehension, and reading habits. Since the purpose of reading for typing is reproduction of symbols, differences from other types of reading in speed, comprehension, and habits may be expected. Fuller¹ says attitudes affect reading and that the emotional attitude set by hate or liking for the activity, by fatigue, and by the difficulty of the task will often decide the degree of efficiency in reading for typing, as in any other reading. The span of recognition—that is, the amount of material absorbed at a single glance—is dependent upon the purpose and speed of reading. Rapid reading requires a broad span. Fuller² found that the average high school graduate reading silently at 290 words a minute had a span of recognition of 1 282 average words in 263 second. A broad span of attention facilitates comprehension by releasing the mind from attention to minor details of form (word recognition), thereby permitting a fusion of letters and words into thought patterns. As a reader becomes more and more free from the requirements of detailed visual perception, he experiences a greater and greater degree of absorption in the meaning of the material read. Since reading for typing requires attention to word detail rather than to absorption in meaning, a wide span of recognition may be undesirable.

¹ Donald C. Fuller, "Reading for Typewriting," *Journal of Business Education*, September, 1943.

² Donald C. Fuller, "Reading Factors in Typewriting," Doctorate Study, Harvard University, 1943.

How should the typing student read? The student must be able to move his eyes effectively across the copy, giving close attention to details, sufficient attention to meanings or word-wholes that the proper word is typed and the words that belong together are in correct order. Slow and careful reading is possible and should be required. Mind wandering is the worst enemy of proper reading for typing. Careful and systematic observation and study of words in a consistent left-to-right direction will defeat any tendency to reading errors in typing. The typist should not attempt to read too far ahead in the copy. Reading ahead of the point where copy needs to be supplied to the fingers may lead to anticipatory responses, which will result in the intrusion of later letters in the present series. Book¹ maintains that the expert's eyes are several words ahead of his hands and that it is this which permits him to control the sequence of the letter-making movements by groups. Dvorak² says that the eye-hand span widens with every increase of ten words in speed and that between typing speeds of 40 and 70 words a minute there is an average increase from 3.9 to 5.9 spaces. The eyes may lag as far back as the letter being stroked or may be more than ten spaces ahead. Sometimes a familiar phrase may permit the eyes to jump far ahead. The range in eye-hand span has been found to be 0 to 13 spaces; in cases where the eye and hand were together, difficult words were being spelled out. Ordinary typists read one word ahead of the typing, and rapid typists read one and one-half words ahead. Fuller's findings conflicted with these opinions that units of reading are set by the stage of mastery. In reviewing data on reading copy effectively, it seems that adaptability is essential to success; that is, ability to read sufficiently far ahead to control the sequence of letter-making movements by groups and ability to slow down when words must be read letter by letter.

Regression, or looking back in the line, is normal to a certain extent. Wide rhythmical sweeps with the eyes which overread, the random oscillations of the eyes, and the introduction of the new and unwanted material are all undesirable. However, regressions may sometimes be used to check on details or to get the meaning. There is some tendency on the part of readers who have the better reading comprehension to make fewer regressive movements.

¹ William F. Book, *Learning to Type*, The Gregg Publishing Company, 1925, page 169.

² August Dvorak, and others, *Typewriting Behavior*, American Book Company, 1936 page 181.

Whenever the student or inexperienced typist reads too much for meaning, he often confronts difficult combinations that result in typing errors, if he does not stop, readjust his attention, and proceed under conscious control. Both these results are accompanied by hesitations and stop pages that force attention away from the meaning. The typist who has not developed skill in the control of his attention cannot type with smooth continuity. The limit in any skill cannot be reached until the whole operation and all its parts function with smooth continuity. One can inhibit the tendency to "read for meaning" by fixing his attention on grammatical structure, spelling, English style, technical shorthand features, typing difficulties, or any factors that may claim attention. This power of inhibition may be extended to shut out every unwanted factor except some desirable one on which the performer knows he must strive with all his might if he is to advance his skill. Indeed, it is a clue to the acquisition of skill. Reading for meaning may be the one desirable factor in producing transcripts of mailable quality—with other factors inhibited or only occasionally permitted to intrude. The teacher who knows how to direct this phase of skill learning can expedite progress.

The foregoing discussion should be sufficient to show that reading in typewriting is a tool of major significance, both as regards accuracy of writing and speed. While the reading of speed test copy is important, reading plays an important part in other phases of the work in typing. For example, the student must read to follow directions in his textbook, to interpret illustrations and graphs and tables, to type assignments for learning forms, to read critically rough drafts that are to be typed, and to proofread his typed work. Reading abilities required in typing are almost as numerous and complex as those required in academic subjects.

Plateaus May Be Prevented Since Bryan and Harter began their experiments with the telegraphic language about fifty years ago much has been written and said regarding the psychological application of the "plateau" to skill subjects. Their studies showed that in telegraphy the sending curve rises more rapidly and more uniformly than does the receiving curve, from the beginning of practice to the learner's maximum ability. Since typing is more like sending than receiving in telegraphy, this would seem to prove that the prevailing opinion among teachers that "plateaus are essential to the acquisition of proficiency in typing because [learning] changes take place during such a period," is a misconception. Much progress in righting this misconception about

plateaus in typing has been made. The Gestalt school exploded some of the old psychological theories, and the plateau was one of them. What was learned during World War II has furthered the opinions arrived at before that emergency.

No one denies that plateaus exist, only their necessity and prevention are in question among teachers. It was once thought that all learning curves showed that this period of no progress occurred at a definite point in the learning. But as it was found that plateaus did not always occur—certainly not uniformly at the same place in the curve—plateaus cannot be considered necessary. It is now the belief of many that plateaus in typing occur more frequently at two stages of the learning curve—during the first semester, shortly after the keyboard has been learned and the student is making the transition from the individual letter level to the word or group level, and during the advanced part of the course, after the typist reaches 50 words per minute and before he achieves the 60 word level. Some prefer to regard the plateau as the “limits of performance” achievable by individuals handicapped by poor tables, chairs, machines, teaching, practice methods, and whatever poor technique they have suffered to grow upon them. Time and again, skill has advanced promptly when one or more of these handicaps have been removed. Most authorities and teachers agree that, if the plateau occurs, it will be during the early training, and then later wherever the greatest effort for speed is being made.

Several causes are given for plateaus by those who have made the problem a study. Dr. James Mursell says:

It is certain that a great many of the plateaus that actually occur in the acquisition of skills are due to nothing more than improperly graded materials. Difficulties are introduced too suddenly or too soon. The control that has been building up, without as yet being firmly established, goes to pieces, and the learner finds that his progress has stopped or even that he is going backward. Yet the very same difficulties could be surmounted quite easily and with beneficial results on the development of the skill, if only they were postponed. Of course, if we insist too soon upon high speed, we create difficulties, for material that otherwise could be handled quite easily becomes very hard.¹

Another found one of the reasons for plateaus was bunched practice too early in the course, and that not until movements have been well

¹ James Mursell, “The Problem of Speed,” *Business Education World*, May, 1942.

co-ordinated, with considerable speed achieved, does bunched practice become efficient. Another authority says a lack of relaxation between strokes is one cause of plateaus. Still another says "In our educational system the effect of drill, formerly thought to be the outstanding factor in learning, is to sterilize the insight of the learner and to kill his interest in the task by the creation of irradiation patterns or plateaus." The older psychologists spoke of stimulating interest to avoid plateaus.

It cannot be said that all plateaus can always be avoided, for they are produced by a variety of causes some of which may be inaccessible. It is certain, however, that an unwise gradation of difficulty or the unwise creation of difficulty by premature speed instructions produces a great many plateaus that can be eliminated.

Plateaus are often difficult to spot because they may be buried under excessive daily ups and downs, that is, a plateau is not necessarily represented graphically by the flat line its physical counterpart would seem to require. The curve may jump up and down from, say, 40 to 50 words per minute and still represent a plateau of around 45 words. Sometimes it is impossible to know just what or where the plateaus are. Although plateaus drain away much time and energy, this is tantamount to saying that the struggle with typing difficulties can be a slow, laborious affair.

Finally, plateaus are not necessary, and many students will not experience them or they will be short. They may be prevented by properly graded materials and teaching techniques that give right learning directions.

How Can Speed Be Developed? Speed is not dependent upon hurry, but upon a control that is the ability to become indifferent to the surroundings and that preserves continuity of stroking. Students should work for speed before their typing techniques and rates have become established at a low level, hence practice to develop this skill may be begun in the early learning stages. Fast writing later is the natural outgrowth of the proper techniques and controls developed during the early learning. The building of proper control calls for very careful and critical attention to details, and this is impossible if the student is too hurried. It seems clear that as a general practice, premature pushing for speed does far more harm than good. Yet, slow practice is in itself not the answer. It is not the slowness that is effective, but rather what the slowness enables the typist to do. If rapid progress is to be made in speed development, there must be thoughtful, analytic,

purposive, intelligent practice If the student is pushed for speed too soon, he is forced to notice secondary considerations and is blocked from noticing primary considerations

Proper interest and motivation constitute 90 per cent of the teaching problem in speed development. Many of the traditionally so called "teaching steps" might well be violated, if the teacher could keep the students wanting to become more and more skillful Cultivate an inherent enthusiasm for typing skill, guide it, teach him to use it, and he will do the teaching job himself

George L. Hossfield says

The majority of typists could increase their present speed an average of 25 per cent if they would eliminate one habit only—hesitation Operators seldom realize the number of times they stop or hesitate, nor do they realize the aggregate amount of time consumed in this way

Hesitations are stop lights in the flow of writing They not only reduce the speed because of the loss of time, but they break the continuity, causing errors Hesitation may be eliminated without special practice by bringing the student to a conscious realization of the number of stops he makes during his writing efforts Uncertainty as to whether or not an error was made is one of the chief causes of hesitation Looking away from the copy to the machine may cause the operator to lose his place in the copy and so consume time in finding it again

Typists need to understand the inefficiency resulting from pushing themselves too hard By writing at a somewhat slower speed, it is possible to write with greater evenness and thus approximate the actual speed at which the operator is capable of writing When one wants to type a sequence of strokes in response to a word in the copy, there will be details of movement to consider, tensions to eliminate, hindrances to overcome Even an expert cannot attend to such details as he should if he is working at high speed, for the mind cannot respond quickly enough When the expert wishes to study the essential details of his form he will type slowly, therefore, a slow rate is much more necessary for the novice He must go slowly to give time to think and to criticize himself Some slow practice, with the mind concentrated on the detail of what one is doing, is required to build form and control Good form and correct control are not static but are essential for an onward, unimpeded, rhythmic flow of movement This flow of movement should be practiced from the start It does not mean pushing for speed, but

trying to work easily and rhythmically and without stoppages and interference. So in working for speed, it is important to use much easy material and type it at an easy rate. If the material is difficult and awkward, it checks the movement, which should not happen. If it is made difficult by insisting upon a very high speed, the movement becomes confused and anxious, which has exactly the same effect.

As the speed increases, the movement pattern changes, in fact, there are probably critical points at which such changes take place rather abruptly. Fast movement is not simply slow movement speeded up, it is slow movement altered. While the detail of the movement does not alter as the shift is made from slow to rapid writing, the general controls remain the same. Everything depends on the focus and balance of attention. This must be acquired without the distraction and worry caused by speed instructions. It also applies to fast movement. Learning itself is always a process of transformation, so, as any skill improves, it changes. The expert does not do just what the novice does, only better, his whole accommodation pattern is different—more efficient, more economical. Although the novice may model himself by the expert as much as he can, yet he can never do so completely. He can study and try to copy the easy flowing movement of the expert, but, if he tries also to copy the expert's speed, he will go to pieces. This shift in the pattern of the movement as speed increases cannot be ignored.

Any rate that just reaches the point above which confusions begin to appear is the upper limit for the bulk of effective practice, and a rate below which laborious detailed movements appear is the lower limit for slow practice. Fast and slow are determined by many factors, among them methods of presentation. Their value lies in the manner in which they bring the learner to distribute his attention. He should push on as rapidly and directly as possible toward the movement patterns of the expert, but all the while he should maintain the proper control, the proper distribution of attention. Occasional speed efforts constitute a challenge, a test of his ability, and may tend to lumber up the whole moving mechanism and actually help the consolidation of proper control. Such challenges should not be set up too early, and they should be interspersed between material designed for easy, thoughtful practice.

The student's progress in speed development must not be retarded by the physical limitations of the learning situation that is imposed

upon him. The learning situation should be so arranged as to make it possible for the learner to make progress on the letter level, the syllable level, the word level, and the expert level all at the same time. Devices that help on a lower level, if not needed for performance on the expert level, interfere with the learner's progress in moving from one learning level to the next. Habits that at first prove helpful may eventually become a detriment because they interfere with subsequent performance and learning. These lower-order habits may tend to persist beyond the time when they are serviceable and will make it difficult for the learner to move on to the next higher skill level. It is this transition that prevents many learners from attaining high speed or may keep them on a plateau for some time. The teacher may not be able to identify the time when this transition should be made, and should the student fail to know, then progress will be halted. Too much group activity, too little individual attention to each student, a too rigid requirement of the number of repetitions of any exercise, or a too rigid classroom routine is to be avoided, because any of these conditions may interfere with the best progress of some students in the group.

Many students cannot successfully control the intensity of their effort. Trying too hard or not trying hard enough may be equally disastrous to the learner. The teacher can be most helpful in regulating the student's effort. He should study each student, keep records of the progress of all, encourage some to try harder and others to try less. Trying less does not mean careless work, but less mental effort rather than physical effort. More students try too hard than too little. Trying too hard is closely linked with worrying by the student over his progress. Each student needs a different appeal, and a large part of the teacher's task is to discover how to do this. Unreasonable standards and far-distant goals may postpone too long a feeling of satisfaction in the student with his results. A learner never learns at his fastest rate when he is faced with a hopeless task. The teacher should adjust the assignments to the varying abilities of the different students, should not set unreasonable standards, and in every way possible should strive to make the student feel that his demands are attainable. The natural tendency of an individual is to relax his effort when his performance becomes satisfactory to himself. Therefore, it seems advisable to arrange the learning situation so that the skill levels overlap to some extent, if possible.

The problem of speed development is largely solved during the early

learning stages, for the typist's rate of writing is largely dependent on his capacity for maintaining good form rather than on his capacity for hard work. At whatever speed his form breaks down, his increase in rate ceases. Good form means correct motions, which are simple, because all unnecessary motions have been eliminated. Correct motions are fast, because they are reduced to their minimum essentials. Correct motions are smooth and move in graceful, continuous curves, not angles, because angular motions require stops and starts at the angles. Correct motions are rhythmic, because timing allows a definite time interval for each motion. Correct motions are calm and unhurried, because there is little need to hurry when all motions have been reduced to perfect minimum essentials. Correct motions are relaxed, because they require less energy and fewer motions. Correct motions are pleasant, because of the mental and muscular stimulation that results from recognizing that the activity is successful and superior.

An essential element in speed development is to learn relaxation. An expert typing at 100 words per minute is working hard and concentrating intensely, but he is also relaxed because he is not working against himself. He is using just the muscles needed to make the necessary movements, and the muscles not directly concerned have just enough tension to keep the movement in line. He keeps his attention on an even keel and picks up just the cues he needs to carry him along. He may be aware of distractions, but he is able to brush them off and to hold the pleasant feeling of the action flowing smoothly along. It is in this sense that the expert is relaxed even when he is going "all out" for speed. Even in his first lessons and practices, the learner succeeds by relaxing, by not working against himself, by holding the pattern of action and perception and attention and feeling on an even keel. He must be learning to hold himself in line, all the way from start to finish. Of course he may not succeed all the time, but good learning depends on maintaining relaxed action at the level of which the learner is capable and on recovering it when it is lost. As the learner improves as his speed moves to higher and higher levels, he is learning to relax under more and more exacting conditions. Getting the skill to transform itself to higher levels and more efficient controls is the secret of progress. How to bring about this growth in skill is one of the subtlest considerations in the whole art of teaching. Pushing for speed in short bursts is one way. All through this process of learning the pattern of action must be kept easy, free and without internal frictions and cross pulls—a

pattern of concentrated energy in a context of relaxation that is muscular, mental, and emotional.

How to Practice. Merely typing is not practice; it is doing what anyone can do—strike keys. Neither does merely practicing increase speed; for if it did, all office typists would become expert in a few years. The observant student should soon discover that there are frequently recurring sequences of letters involving peculiar finger movements on which he must spend some time in order to master their execution. A well-directed plan of practice is fundamental, regularity of practice is absolutely essential, and the most economical practice procedures are necessary if speed is to be gained in a minimum time. This makes it necessary to know the purpose of practice and to select appropriate materials and procedures so that the purpose can be achieved. If this is done, appropriate speed with acceptable accuracy can be attained.

The purposes of practice in typing are skill building, which involves accuracy as well as speed, and problem typing, which involves the ability to organize for work as well as the skill to type the work. It is problem typing that trains for production. When the lesson is built around problem typing, it is necessary to provide needed practice for skill maintenance. The problem may change in content and difficulty and the practice materials for skill building may change likewise, but the sequence will not change—skill building must be followed by typing from problem situations. The length of the periods of emphasis on skill building cannot be definitely fixed. Experience indicates that best results come from a program of fairly short emphasis on skill building followed by a pause to use the skill in typing problems, then another emphasis on skill building, and so on in a cycle of emphasis that varies more in the rate and difficulty than in the procedure used. In an article on "How to Increase Your Students' Speed in Typewriting" in the *Balance Sheet* for April, 1946, D. D. Lessenberry gives this advice:

Know the purpose of the practice; select the materials that will aid the student to achieve the purpose; and choose a practice procedure that is appropriate for use with the materials and in keeping with the purpose of practice. The purpose of practice may change more frequently than either the materials or practice procedures.

When skill building is for the purpose of increasing speed, the word-recognition level of response should be used; when it is for control, a

drop back in speed in order that emphasis may be on ease and continuity in stroking will facilitate the development of accurate typing. It is basically unsound to use the letter level of response in typing any material that can be handled on the highest response level, but psychologically it is sound to use any device that will build confidence in the typist. This is done when the letter level of response is used. This response level should not be used if the timed writing is to be checked for speed, as it restricts the rate with which a student can type. The student must know what level of response to use. The initial practice on any new reaction effectively sets the stage in the learner's mind and response system. Whenever a new reaction is to be learned, the function of the initial practice is to give the learner a clear sense of what is to be acquired rather than a final and perfected result.

Since the learning of "right motions at standard speeds" is entirely an individual matter, it follows that many teachers should materially reduce the amount of class or unison drill. Mass drill should be employed only where it serves the useful purpose of economically presenting a definite "how to practice" technique or standard of performance to all or most of the individuals in the class. Very little of the unison drill done in typing classes, unfortunately, has aimed at the mastery by individual students of "right motions at standard speeds." Too often it is used as an end in itself, so that the learning activities have consisted of wrong motions at wrong speeds. If drill is to be effective, it must make definite and measurable improvement in the work of each student, and it must contribute to greater typing skill. Drill can be for specific and realizable purposes. Drill can be effective in developing quicker stroking, smoother operation, equalized power behind the strokes, and greater certainty of control of the entire keyboard. Drill can be used to quicken the carriage throw, to develop facility in the shifting process, and to set up a pattern of efficient machine manipulation that will add to the total production. Drill work can do these things and it must do them if it is to function in skill development.

Some practice must be done each day to speed up the fingers a bit, to force the typist out of a rut, and to make the fingers more flexible and adaptable to the sequences of letters they must execute. The daily warm up drill, engaged in promptly upon arrival in the classroom, is a routine that can start this finger training. The idea of lightness and freedom of movement must always be kept in mind in all practice, whether fast or slow. Whatever the drill may be, it should prevent

the typist from falling into sluggish habits. The intensive practice of words containing different combinations of letters, easy sentences, and paragraphs tends not only to accelerate finger action but to secure that continuous, well timed succession of blows on the keys that is productive of high speed.

Words can be effectively practiced in a number of ways. If the words are short and easy, a simple plan consists of typing three repetitions of each word in a group. When the words are difficult, because of length or sequence of letters, a piecemeal plan is best. Break the words into pieces and practice each piece separately, for example, *con con consid sid sid consid consid consid der der der consider consider consideration ation ation ation consideration consideration consideration*. When doing word practice, the speed should not be forced to the point of making errors or losing control but may be gradually increased until the writing can be done as rapidly as the fingers will respond accurately. The mind should be kept intently on the work, for lack of concentration generally causes errors. To relieve monotony, the word practice may be varied with some sentence practice. Alphabetic sentences are best for obtaining a thorough command of the keyboard, but they cannot be written as rapidly as others containing words that are more common. If the student has difficulty with a certain finger or with certain letter frequencies, he can select words containing these and do intensive practice on them. This intensive word and sentence practice should be carried into the advanced classes.

The attitude with which the student approaches his practice work has everything to do with what he accomplishes. To be of greatest value, his practice should be spirited, have snap and enthusiasm, and really be enjoyed. The student should not be allowed to reach the point where he looks upon it as an unattractive task. The teacher must vary the work so that the student will be getting the necessary repetitive practice and yet not recognize it as such. Competition may sometimes be injected into the work and prove stimulating, but if it is used too much, its effects will deteriorate. When the abilities of the class are quite equally balanced, competition with one another is excellent, but when the same student wins all the time, each student must compete with himself. While this may not be so colorful, it may prove more helpful to the individuals than class competition. The teacher should not need to "bribe" his students to practice by using awards. The reactions of the students should be watched and diversions or changed

procedures introduced whenever necessary. The quality of the practice activity determines in a large measure the amount of improvement.

If the student has never written 50 words per minute, he does not know what it feels like, for each new level of speed calls for a new set of adjustments. He must reach the higher level by writing short tests, and when he has attained it, he will get the feel of the new speed. Then he must do it several times with different copy, so that it becomes a permanent achievement. The extent of the period of effort of most people is estimated at about three minutes, hence the student's efforts to seek the new speed level should not be longer than three minutes. One minute is suggested for the elementary typist and two minutes for the advanced. Neither the student nor the teacher should be satisfied with doing one such test successfully—he should do several and at longer periods of time until the new speed has become a part of him. This is the fixing process. Experienced typists have agreed for years that, in order to acquire speed, some repetition is essential. To be useful, repetition must be made interesting by motivation. The consciousness that they are working for a definite speed level should make them enjoy practicing. Repetition is a short cut to expertness in typing, but it is also a means whereby a newly felt skill may be fixed as a permanent part of one's capabilities. It is a means whereby the typist pulls himself up to the next higher level of skill. Recent experience has shown that these finding and feeling processes will progress more rapidly on the word and phrase level, sometimes even on the part of a word level, but always the student will have to exert himself for one and two minute stretches in order to polish off the better techniques he originates in the very brief, intensive efforts and to incorporate them into his composite skill.

There are several different ways of using a short paragraph for speed development purposes. In his article, "How to Build Typing Skill Quickly," in the *Business Education World*, March, 1942, Harold H. Smith suggests a practice routine that he set up for the training of typists for World War II. It is a plan of speed training that can be adapted by teachers or individuals to various uses in skill training. In another article, "How to Increase Your Students' Speed in Typewriting," in the *Balance Sheet*, April, 1946, D. D. Lessenberry has suggested four other plans to achieve four objectives, namely, speed spurts, sustained typing, guided writing for accuracy, and accuracy progression. These articles offer excellent ideas for skill development.

The Value of Timed Tests, or Writings Perhaps the commonest form of speed practice is the timed writing of short paragraphs that have been previously practiced. Accuracy for such practice consists of eliminating from consideration all timings that have more than an error per minute of writing, because penalties are not deducted. After the first timing, any troublesome words or combinations are practiced. His goal on the second timing will be to increase his typing power by increasing the number of strokes or by reducing the number of errors made. This type of practice will get speed results so long as the student is interested and keeps trying.

There are two kinds of timed efforts: short timed writings of from $\frac{1}{2}$ to 5 minutes, and long timed tests of 5 or more minutes, 5, 10, and 15 minutes being the length of time generally used. Short timed writings are particularly helpful when an improvement in speed is the immediate aim. Long timed tests are particularly helpful in developing the endurance and steady fluency that give sustained skill. The timed writing, or test, may be used wherever motivation to intensive effort for speed, accuracy, and fluency is desired.

The principal value of all timed writings is the powerful motivation they provide to individual students. Wherever skill is required, wherever speed, accuracy, and fluency are to be secured, the timed writing is the best form of drill for fixing improvement. Literally hundreds of associations must be faced by the student as he types. Whether they affect his attitude or his skill, they must be handled by him either in the right or in the wrong way. Until he can learn how to inhibit these associations that hamper his progress, he will remain a somewhat poorer typist than he should be. To some extent he can learn how to handle these extraneous associations better while typing a competitive test, but usually his mind is fixed on just one thing—piling up a sufficient number of gross words with enough accuracy so that his net rate will place him as high as possible on the class list. What he needs is to set about killing off these useless and hampering associations. He can do that only by working individually, first, on short and then on longer units of typing—one line first, then two, three, and more lines. The teacher should see to it that such a student becomes aware of the need, that he gets a certain amount of individual and perhaps class drills in overcoming that particular weakness. Then, the teacher will use short timed efforts to fix the incipient good habits and gradually lengthen the writings until the desired habits are woven deep into the student's skill.

The competitive test, formerly called the speed test, is more a measurement of skill in the eyes of both students and teachers than it is a device for developing skill. It is a device for measuring the student's ability to sustain his speed for a given time. As the time lengthens, the speed may be reduced proportionately. Studies have shown that at least three minutes is necessary before one's true speed or writing rate can be measured. This is merely saying that timings of less than three minutes are only spurts of speed and, while they are valuable in developing the "feel" of fast operation, they cannot be called the student's speed. No normal human being can resist the temptation to test his skill against that of his neighbor, but if his attention is always directed to the net result of his skill, he will not overcome his weaknesses except in a very unintelligent and haphazard manner. Hence, he will not improve his net result as rapidly as he might otherwise, and it is not to be wondered at that students go "speed crazy" or teachers become prejudiced against the timed test as a teaching device. Since the competitive test is ordinarily used but once a week, there are at least four other practice periods, constituting 80 per cent of the student's practice time, which he should use to best advantage. There seems to be at this time no better device than the properly handled timed writing to insure this desirable end at certain stages of the course. Its only competitive feature should be that the student is competing with himself and his former records.

By using the proper length of timed writing, the teacher can absolutely control the duration of a student's learning effort on each phase of his improvement. The teacher can, to a large degree, determine the direction of that learning effort by simple suggestion and manipulation of the procedure leading up to the timed writing and by a wise selection of the subject matter of the test itself. Short timed writings should always be used in the early stages of improvement of any phase, whether it be mental or manual. The really intense effort that an increase in speed demands produces great fatigue. It disrupts the mental and physical controls that are geared to the expenditure of less effort. Short timings permit the student to make the necessary adaptations for these faster responses of mind and hand. As in everything else, speed is largely a matter of increasing the energy, the horsepower, of the writer. The student settles down more on a longer test and thereby develops the positive mental controls that determine accuracy and steadiness or fluency. Too many timed efforts are taken without any other aim than "Let's take a test." The teacher is responsible for seeing

that there is a correct and vivid aim for each timing, because the quality of the learning is gauged almost entirely by the vividness of the student's aim

The selection of material for timed tests is a vital matter. Short words make easy matter, and easy matter encourages speed, accuracy, and fluency, if the student types intelligently. Long words may make matter difficult but will encourage the improvement of concentration and attention. Familiar matter is usually easy and enables the typist to set up and control new mental habits that will increase his skill. Such familiar matter practice should be mostly on short paragraphs and little of it on special speed or alphabetic sentences. One advantage of familiar matter that is often overlooked is the facility it gives the typist in the control of inhibitions. Because the matter is familiar, he finds himself anticipating sometimes the right and oftentimes the wrong word or phrase. These anticipations must be controlled, or errors will result. Likewise, he is more apt to let his attention wander on familiar than on new matter. New matter encourages concentration on and attention to the stroking. It tends to curtail speed somewhat, and the fear of running into a difficult combination with too much speed is ever present. General fluency should be aimed at, of course, but it is well to encourage students to hesitate if they face an uncertainty in fingering new matter. Generally, new matter should be typed at a rate below one's best speed. This will permit of improving accuracy and fluency. Matter composed of words of high frequency will encourage the development of speed after the student gets over the individual stroking stage and begins to develop his ability in handling combinations. Conversely, matter composed of rare or less frequently used words will call for more work on the individual stroking level and will cut down speed. Both types of matter should be used, but always intelligently and with purpose.

The timed effort is a splendid teaching device in every part of the typing course, whether in the development of fundamental skill or in training for practical office production. It should predominate as a teaching device in the early part of the course immediately after the student becomes able to find his way about the keyboard, because it offers the finest opportunities for the development of continuous typing skills and leads most rapidly to the highest level of typing skill. The timed writing will not be useful when the student is learning individual stroking, reach stroking, and shift stroking movements. This is largely

because the duration of the learning effort is necessarily so short that it cannot be easily measured. The timed writing is used whenever the teacher demonstrates a stroking movement and asks the student to execute the same movement in the same way. The element of time or speed is inseparable from any movement. In the learning of combination movements, the timed writing cannot be used to advantage for the same reason.

When the timed writing or test is used, it should be with a singleness of purpose and a clarity of aim based on the needs of the individual at that particular moment. This can best be accomplished through student self-criticism, but many opportunities are offered where the teacher can suggest to the student certain aims a moment before he undertakes his test, so as to insure right direction of effort. The teacher must be careful not to suggest too many aims or aims that may conflict. A wise teacher can supply just the stimulant a student needs for his best efforts by a well chosen remark before an important test is written, but never by a prolonged discussion or lecture.

As soon as the student has been introduced to the idea of continuous practice and has had some experience in it, he should be submitted to short, timed writings not longer than a minute each, sometimes a half minute serves the purpose better. Short timings are "speed forcing," while long timings are "speed fixing." Short timings represent the short dashes in athletic meets where the running is faster. Likewise, in typing one can type 5 to 10 words per minute faster on a 1 minute test than on a 10 minute test. Long timings represent the distance events of the track meet, and they train for "distance" work in the daily grind of the office by building endurance and sustained speed. A 15 minute test is an even better measure of sustained skill than the 10-minute test and more closely reflects a typist's capacity to type for much longer periods. Some teachers choose to build sustained speed by giving 20 minute and even half hour tests just before they release their students for the business office.

After a short timing is completed, the student's attention should be turned immediately to his accuracy, after which speed and fluency should be checked depending on the purpose of the test. As soon as the student knows how to handle continuous practice, he is ready for paragraph work. Sentence practice is merely an approach to paragraph practice. Much more interest attaches to paragraph work, and its early introduction is justified by that alone. As soon as paragraph practice

starts, longer timings may be used. The wise teacher will lengthen the timing gradually until, by the end of the first semester, the students are able to write well for 5 minutes. During the second and third semesters, 10 minute tests should predominate as long, timed tests and 15 minute tests during the fourth semester. At least one competitive or long timed test should be given each week, Friday being preferred by most teachers—never Monday. This keeps the student's attention fixed on the need for improving his fundamental skill during the practice of the week, for he will be anxious to make a good showing with his class as well as a good grade for himself, since this may be his graded effort for the week. There is growing favor toward giving two tests (Wednesday or Thursday, and Friday) and the student chooses the test he thinks represents his best effort. The short timed writings become the means for specific improvement in the interim between long tests and furnish an interlude to practical work, making the students feel their responsibility towards their skill development more keenly. It pays to take time to make the student aware of what he has done by graphs or class lists and thus give him food for thought as to what he should be doing.

Many teachers have tried the timed writing idea and have discarded it because they felt it failed, either through an encouragement of inaccuracy or because of some other reason. In too many schools it has been woefully misused. The timed writing, rightly used, is one of the most helpful devices at the command of the teacher of typing. Throughout the typing course the teacher should attempt to win the intelligent co-operation of the student, to the end that he may know *what to practice* and *how to practice*. Likewise, the competitive or speed or timed writing must be properly used. The stage must be intelligently set by the teacher, the test must be efficiently and fairly conducted to inspire confidence through a recognition on the part of both teacher and student of its unqualified fairness and importance, and, above all, it must be administered in such a way as to enable progress to be made, checked, recorded, and studied. Without these it will fail. The timed writing can only fail when the student's natural enthusiasm for it is in some way dampened, or when his attention is not directed to an analysis of his real needs with helpful suggestions as to how to meet them. These difficulties are easily within the power of the teacher to control. If he does not or cannot control them, he will find himself

beset by the selfsame shortcomings in every other form of intensive practice. For such a teacher and for such students the solution lies in giving as much training and experience as possible in typing the kind of thing that business and the future use of the machine will require. The importance of the short, intensive, intelligent effort to increase speed and fluency, both in basic and in applied typing, is evident.

What to Practice. The selection and organization of materials for instruction in typing are as much a part of the preparation to teach as is the determination of teacher activities or the setting of standards. An effective typing text should be organized in units of action purposeful to students. The material used should guide but not restrict the ingenious teacher, and it should be rich in suggested teaching devices. In all drill or practice work, the student should share with the teacher the responsibility of determining the most appropriate practice procedures as well as the most useful practice materials. Of course, the teacher frequently, because of his superior knowledge of how learning takes place and because of his experience in training typists, can determine the necessary practice materials and procedures more accurately than can the student.

In recent years authors of typing textbooks have joined in an effort to emphasize practice on the commonest words. This movement was probably stimulated by studies in the field of spelling and in the frequency of use of words. It has often been stated that, since the first 1,000 most frequently used words comprise about 90 per cent of the ordinary typing copy, the student should be given a great deal of practice on those words. Consequently, in many typing textbooks the practice or drill matter for the first semester is composed chiefly of these commonest words. Word frequency counts are still the best criterion by which to judge word values, and when that word frequency count is based on the use of words in business, it becomes of even greater value. Therefore, it behooves the typing teacher to be familiar with each new word count as it appears.

The first authentic list of common words that was available to typists was compiled by Leonard P. Ayers, director of the Division of Education of the Russell Sage Foundation. His investigation was the first published evidence on the relative frequency of words used in correspondence. It appeared in 1913 and was called *The Spelling Vocabulary of Personal and Business Letters*. It consisted of 1,000 common

words. He utilized hundreds of letters of different kinds and did not confine himself to the investigation of the letters he himself collected, but combined the results with those of three similar studies made by other persons and averaged them all. The aggregate amount of written material analyzed by his study was 368,000 words. When the work was completed, the greatest surprise was not how many different words are used, but how few. It has long been known that there was a definite relation between any letter of the alphabet and a given number of words, but Ayers proved that the same thing is true of words. While later studies made some changes in his findings, yet it should be said that his study proves the importance of these words in the writing vocabulary of the typist.

The investigation of Ayers was followed by a number of others, including either business or personal letters or both. The most extensive of these early investigations were those of Cook and O'Shea in 1914, *The Child and His Spelling*, consisting of approximately 200,000 words of personal correspondence. J. D. Houser in 1917 made a study called *An Investigation of the Writing Vocabularies of Representatives of an Economic Class*. In 1921, W. N. Andersen made a study called *Determination of a Spelling Vocabulary Based upon Written Correspondence*. In 1919, Ernest Horn, of the University of Iowa, combined the words of all correspondence studies that had been made up to that time, and as new investigations were completed and available, their data were added to this compilation. By 1922, this compilation contained an aggregate of 865,000 running words. By 1926, the total number of running words had reached over 5,000,000, from which the 10,000 words appearing most frequently were published in *A Basic Writing Vocabulary*. In 1921, Edward L. Thorndike, of Columbia University, published his first list of 10,000 words, called *The Teacher's Word Book*. In 1931, Thorndike extended his list to 20,000, and in 1944, with the collaboration of Irving Lorge, the list was further extended to 30,000 words. When counted on the Horn basis with a separate entry for each plural and other derivatives, the 30,000 Thorndike Lorge list represents probably 45,000 words. Considering that the number of words in each Thorndike list represents many more than that number, when computed on the basis of the Horn lists, it is significant that Dr. Thorndike felt it to be worth while to go on and increase his list from 10,000 to 30,000 words. In 1943, Dr. Ernest Horn and Thelma Peterson, also of the University of Iowa, published *The Basic Vocabulary of*

Business Letters, which is a list of 15,000 words most commonly used in business letters. The business letters used were from twenty six large classes of business, and averaged six different firms in each class. The words for each class of business were arranged in alphabetical order, with the total frequency for each word. It was found that most of the words used with high frequency in the letters of any business are also found in the letters of other classifications of business. Neither the Thorndike-Lorge list nor its two predecessors can ever be so useful to the typing teacher as either the Horn list or the Horn Peterson list. Much harm may be done to the teaching of typing by a misunderstanding of the significance of the idea that a few hundred words make up 75 per cent of all running discourse. This is true, but it is even more important for the typing teacher to remember that the remaining 25 per cent of running discourse consists of tens of thousands of different words, some of which may occur only a few times in a lifetime, some of which may occur only a few times a year, but all of which must be written rapidly and accurately on the typewriter when they do occur. It is impossible to attempt to automatize all the 15,000 words of the Horn Peterson list, any one of which may occur at any time. The only alternative is to develop the ability to type them by automatizing as many of the most frequent words as possible and the sequences and combinations that make up the less frequent words. These, then, should demand much of the practice time of the typist. Naturally, the Horn Peterson list cannot be given in this book. It was published by the Gregg Publishing Company and the words are available in both alphabetical and frequency form.

Letter Frequencies The frequency of the various letters of the alphabet are important enough to be taken into consideration when studying skill development in typewriting. For example, Lessenberry found in his error study that *m* was written for *n* more times than any other reach error, while the error of *n* for *m* ranked fifth in frequency. Why this difference? Largely because *n* ranks seventh in frequency while *m* ranks fourteenth. Likewise, the error of *r* for *t* ranked second and *t* for *r* was the third commonest error. This is due largely to the fact that *t* ranks second in frequency and *r* ranks eighth. In 1926, Dr R. E. Hoke made an extensive study of the frequency of use of the letters of the alphabet. According to his study the letters ranked as follows: *e t a o s i n r h l d c u m y b p w f g v k j x q z*. Arranged in graphical form, the results of his study appears as follows:



GRAPHIC REPRESENTATION OF THE
FREQUENCY OF USE OF THE LETTERS

Although Doctor Hoke's study¹ was made some time ago, its real value was not appreciated until recent years. One interesting fact he found was that the first six letters (*et a o s i*) are used more frequently than the remaining twenty letters. Another startling observation was the fact that *e* is used more frequently than twelve other letters combined (*y b p w f g v k j x q z*).

Studies were made by August Dvorak² at the University of Washington in 1932. While they were never published, their results are shown in tables given in *Typewriting Behavior*, which compare his findings with Doctor Hoke's. They are in quite general agreement. Whether one accepts Hoke's letter frequencies or Dvorak's matters little, because both show the influence

of letter frequency upon the accuracy of key stroking in typewriting. It might be added also that any study of letter frequencies will show that had this been done before the arrangement of the typewriter keyboard was set up, a more scientific plan would have resulted, which would have promoted more accurate writing. No one denies that many errors are caused by the arrangement of the letters on the keyboard.

One of the more recent studies is worthy of mention here. It is recorded in Donald D. Milliken's "Elementary Cryptography and Cryptoanalysis" of 1942 and published in 1943 in an article by Laurence D. Smith, titled "Cryptography."³ The following is taken from Appendix C of the original article. A careful comparison of its findings in

¹ R. E. Hoke, *The Improvement of Speed and Accuracy in Typewriting*, Johns Hopkins Press, 1928.

² Dvorak, Mernick, Dealy, and Ford, *Typewriting Behavior*, American Book Company, 1938, pages 347-350.

³ Laurence Dwight Smith, "Cryptography," W. W. Norton & Company, Inc., New York, 1943.

letter frequencies shows some differences to the Hoke findings, and their consideration will aid teachers materially in training students for greater accuracy and speed in typewriting

Letter and Word Frequency (English)

Order of frequency of *single letters*

ETOANI RSH DL CWUM FYGPB VK XQJZ

Order of frequency of *diagraphs*

th er on an re he in ed nd ha at en es of or nt ea ti to it st io le is
on ar as de rt ve

Order of frequency of *trigraphs*

the and tha ent ion tio for nde has nce edt tis oft sth men

Order of frequency of *common doubles*

ss ee tt ff ll mm oo

Order of frequency of *initial letters*

T O A W B C D S F M R H I Y E G L N P U J K

Order of frequency of *final letters*

E S T D N R Y F L O G H A K M P U W

One letter words a, I, O

Typewriter keyboards are arranged today as they were soon after the invention of the typewriter. This arrangement had no regard for the frequency of the letters of the alphabet or their syllabic combinations. It is generally believed that the disregard of this not only increases the liability of error but also retards speed because of the slow finger manipulation it necessitates. This arrangement will not be changed, unscientific though it is, until an appreciable increase in production can be clearly demonstrated. A real, not a theoretical, production increase of at least 25 per cent in large offices would cause a reduction in overload that would justify the change. The demand for such an improved efficiency will have to come from business just as the demand for typists in World War I forced schools to see the greater efficiency of group or class instruction in typing.

Motivation for Speed Work Teaching should not be measured in terms of teacher activities alone but also in terms of student activities. What the teacher does in the classroom is reflected in what the student does. Therefore, motivation of student practice in typing is a challenge to the teacher. Getting the student to *want* to type the drill is the first step in motivation. He must see in the work assigned opportunities for the development of his skill, not just tasks to be performed so grades may be assigned. Motivation can and should be broadened to include

attitudes to be developed as well as typing practice to be done. The development of correct attitudes is sometimes more important than the typing to be done. The typing will be more productive of desirable outcomes if the best attitudes are developed along with it. Motivation can be secured through teacher and student co operation. The best practice is self motivated. This is obtained by the study of his errors, his technique, his habits, his personal fitness, and, in fact, all those elements necessary to skill progress. It involves isolating a weakness and determining how to overcome it. It calls for remedial thinking, which should precede corrective drill practice. Thus, the student shares with the teacher the responsibility for isolating his difficulties and for choosing the corrective practice.

Most students are eager, interested, and really want to learn to type. This initial enthusiasm for typing coupled with an enthusiastic teacher, will provide sufficient motivation at first. But it may lose its potency when the novelty has worn off and the hard work that is necessary begins. It is then that other sources of motivation must be relied on. The motivating influence of the teacher's personality may be all that is needed at this point. Some teachers are so endowed with personality that they fire their students with enthusiasm, but the teacher who lacks this trait must cultivate every opportunity to build effective motivation in the classroom. The general atmosphere that accompanies the teaching is an important aspect. This is created by a wholesome teacher student relationship, which grows out of an attitude of helpfulness and encouragement on the part of the teacher and a receptive attitude on the part of the student. If the student can grasp the goals and objectives that the teacher is trying to convey to him, and if that is accomplished and understanding plus co operation ensues, then real motivation takes place. When a student can see for himself that he is making progress in acquiring skill in typing and can also see a practical and immediate advantage in the acquisition of greater proficiency, then certainly he will be inspired to further effort. Indifferent students should be made to see the usefulness of greater skill, so they may be inspired to expend greater effort to attain it.

Perhaps the fact that many teachers are not thoroughly equipped through personal mastery of the subject matter and skill in typing accounts largely for the emphasis that has been placed upon motivation devices in the teaching of typing. The result has been to encourage teachers to gather together an indiscriminate collection of teaching

devices, too often their competency is judged by the variety of these and not by the efficiency of their students. A good motivating device not only will be pointed directly toward a desirable objective, but it will not be used after that objective has been attained. Teaching devices for motivating students are vital, but many of them should occupy a diminishing proportion of time as the course proceeds or else give way to some more appropriate device. Countless motivation devices have been worked out with varying degrees of effectiveness to provide stimulation for student progress. Many teachers minimize the use of most of such interest creating schemes, believing the influence of the personal element superior.

One of the most efficient methods of promoting more economical learning is to draw on the student's own "will to improve." This can be done through any of the many methods that can be employed to make the student always aware of the progress he is making. Some sort of graph, profile chart, or other means should be devised so that both teacher and student can see what success is being achieved during his weeks in typing. Through conferences with him about these records, much progress can be made in finding remedies for the situation, should a plateau or recession occur. This personal attention will show the teacher's interest and give an opportunity to commend, sympathize, recognize good work, while it also affords the ideal situation in which to suggest improvement. Oftentimes the typing teacher and the student reach a point where the work and the ultimate goal seem hopeless. This is a challenge for the ingenuity of the teacher. The aim, then, should be to secure change and variety without losing sight of the real purpose of the practice, and to plan for a pleasant surprise now and then without lowering the value of the instruction.

Competitive stimulus is one of the best motivating forces in teaching typing because it (1) gives students an opportunity to measure their ability with their fellows, (2) inspires students to their best efforts, (3) teaches them to be good losers, (4) gives them an incentive to excel in other ways, and (5) promotes interest that will induce practice. Competition, if properly used, furnishes variety beyond the dull routine of the classroom duties. If used continuously, it loses its effect, if used intelligently, it can promote real progress in all phases of the work. Various types of contests may be kept within the class group itself, they may include more than one class, or they may be between two or more sections doing the same work. Large classes may be

divided into groups or teams. The method of choosing the teams or groups is most important because it may cause unfriendliness. If the teacher permits the students to direct it, there will be less cause for criticism. The teams should be well balanced in ability if a keen contest is to result.

To summarize the whole problem of motivation, the following points might serve as guiding principles to be used with any motivation device: (1) all students should profit by the use of any major motivation device, (2) a variety of motivation devices is the most effective, (3) each device used should be short lived to insure interest, (4) the motivation devices should cover all aspects of typing skill, not just speed and accuracy, and (5) the beginner should not be neglected—praise and commendation may be sufficient to motivate his work. Since most students are interested in self improvement, have the student compete against his own record, urge him to analyze his own progress, and, so far as possible, plan his own learning activities. Set up in his mind a definite purpose for learning the different elements of a well rounded typing skill, then, if he is kept informed of his progress, he may be urged to be critical of his own effort and satisfied with his success.

The Rules for Error Checking. Most schools use the rules that J. N. Kimball set up for the International Typewriting Contests many years ago for checking errors. His word as to what constituted an error in typewriting was law. To him much credit belongs for his wisdom and impartial judgment. The last revision in rules was made by Mr. Kimball in 1926 and his last International Contest held in 1931. Since then agitations have developed from time to time for a complete revision of these now called "International Rules."

In 1933, W. C. Maxwell, of Hinsdale, Illinois, organized and conducted what he called "International Commercial Schools Contests." These contests brought a demand for some revisions in the rules, and in 1937 Mr. Maxwell published a set of revised rules that he used during the time his contests were held. Some typing textbooks give the International Rules, but always with adaptations or changes that the author of the book favors. There is no doubt that some changes should be made. The author has given considerable thought to the matter, particularly in respect to a set of rules that could apply to all work in typing, whether timed writings or lesson assignments. As a result, the following rules are submitted.

1 *Line Spacing* Single space, with double space between paragraphs all short timed tests (tests under 5 minutes) and double space all long timed tests (tests over 5 minutes) Every line incorrectly spaced is penalized one error in addition to all other errors in the same line

2 *Length of Line* Lines in test work must average 70 spaces whether pica or elite type is used This means that, except at the end of paragraphs any line having less than 64 or more than 76 spaces is penalized one error as a short or a long line This penalty is in addition to all other errors in the same line

3 *Length of Page* Except for the last page of a timed test, at least 29 double-spaced lines must appear on a page 8½ by 11 inches and 35 double spaced lines on a page 8½ by 13 inches One error is charged for a short page—not one error for each line the page is short. This rule will not apply to single spaced short timed tests

4 *Paragraphing* Indent paragraphs 5 spaces starting on the sixth space An error in paragraphing is penalized in addition to all other errors in the same line

5 *Spaces and Punctuation Marks* An error in spacing or in punctuation is considered an error in the preceding word unless that word has already been penalized

6 *Spacing After Punctuation* Except as noted below space *once* after all punctuation marks *within* sentences or *within* word groups not forming sentences, and space *twice* after all punctuation marks that *close* sentences or groups of words not forming sentences

There is good authority for following the above rule when spacing after the colon but there is equally good authority for always spacing twice after a colon Charge an error for every failure to space consistently according to one of these rules

It is better form to omit the space in small letter abbreviations such as *a m*, *f o b* etc Many authorities prefer no space in capital letter abbreviations (except initials of personal names) such as *OK PM Ph D* etc but a space after the period following each letter in all abbreviations is acceptable in all schoolwork Failure to be consistent in a given piece of work constitutes an error

7 *The Dash* Two hyphens with no space before or after must be used in all test work In other work one or two hyphens with a space before and after may be used This is not advisable in tests because the stroke count does not allow for the extra strokes

8 *Cut Characters* Any word written so close to the top bottom or side of the sheet that any portion of a letter is cut off must be penalized

9 *Incorrectly Divided Words* A word divided incorrectly at the end of a line constitutes an error A word hyphenated at the end of a line in the printed copy may or may not need the hyphen if it occurs medially in the line Follow any standard dictionary for the authority on correct division

10 *Faulty Shifting* A shifted character (capital letter) is acceptable only when the entire character is printed and when no part of another character

on that type bar is visible. If the complete character is discernible, although raised above the line, no error is charged, but it should be considered bad typing and errors might be charged until correct shifting results.

11 *Lightly Struck Letters* If the outline of any character is discernible there is no error. If keys are habitually struck too lightly, charge an error for every lightly struck character until the keys are more forcefully struck.

12 *Transposition* One error is charged for each transposition either of letters or of words. Errors within transposed words must be marked as additional errors.

13 *Rewritten Matter* Charge one error for the rewriting and an additional error for each mistake in both the first and the second writing. Include the repeated strokes in the total strokes at the end of the test.

14 *Omitted Words* Charge one error for each place where words are omitted and deduct the strokes in the omitted part from the total strokes at the end of the test.

15 *Inserted Words* Every word inserted, misspelled, or in any manner changed (except in transpositions and rewritten matter) must be penalized. No credit is given to the total strokes in a test.

16 *Crowding* Any word occupying fewer than its proper number of spaces is an error.

17 *Piling* When two characters or a space and a character are so crowded that one is printed on top of the other, or if any portion of the *body* of a character overlaps or extends into the space between words so that it would overlap were a character typed in that adjoining space, the machine is said to have "piled" and an error must be charged.

18 *Left Hand Margin* All characters at the beginning of lines, except at paragraph indentations, must be struck at the same point on the scale or an error must be charged for each violation.

19 *Xing Work* in which letters are "struck out" or x'd will not be considered in contests and must be charged an error in other work.

20 *Erasing* Erasing is not allowed in timed tests and in other work only when the teacher directs it.

21 *Last Word in Tests* The writer must stop when the time is called. An incomplete last word is not an error unless an error has been made in writing it.

22 *Errors in Printed Copy* Errors in the printed copy may be either corrected or written as in the copy.

23 *One Error per Word*. Not more than one error may be charged in any one word.

24 *Gross Words* Obtain the total number of strokes typed by using the stroke count given at the end of each line in the printed copy. Deduct strokes for omitted words and add strokes for rewritten words. Divide this total by 5 (a word is defined as 5 strokes) to find the number of *gross words* typed. Drop one or two left over when dividing by 5 and add as a whole word three or four left over. Use no decimals or fractions of words. Take credit for every stroke typed.

25 Net Words Multiply the number of errors by the penalty used—10, 5, or 1—and subtract this from the gross words. The result will be the *net words*. Divide the net words by the time of writing, carrying it one decimal place and dropping what remains. The result will be the *net rate* or *net words per minute* or *net speed*. If a penalty of 1 is used, this result will be called the *correct words per minute*.

It is the opinion of some teachers that the only accurate measure of a typist's speed on straight matter is his gross words per minute (gross words divided by the number of minutes) and the only accurate measure of his accuracy is his error rate (total errors divided by the number of minutes). This permits a student to study his speed development and accuracy improvement on practice timed writings and is recommended for that purpose only. While there are many staunch advocates of the 10-word penalty for each error who maintain that the severity of the penalty will cause greater care and concentration on the part of the student, there is also a trend to return to the 5-word penalty formerly used. Some are advocating a 1 word penalty, which means simply eliminating from the gross words one word for each error that was made, thus obtaining the number of correct words written. When these are divided by the time of writing the correct words per minute are obtained. This really makes a more meaningful rate to the student and acts as an incentive to further development. The plan is recommended for the first efforts at timed writing. Later, the 5 word penalty may be used, and for the advanced student the 10 word penalty should be used. Some advocates of the 1 word penalty believe it necessary to limit errors to prevent the student from ignoring accuracy because of the insignificant penalty.

CLASS DISCUSSION QUESTIONS

- 1 Give as many definitions of speed as you can. What does typewriting speed mean to you?
- 2 What is the highest speed that has been made on a manually operated machine in a 60 minute contest? By whom was it made?
- 3 What is the highest speed that has been made on an electrically operated machine in a 60 minute contest? By whom was it made?
- 4 Why is it unfair to compare records made on manually operated and electrically operated machines? What distinguishes an expert typist from an amateur?
- 5 Who is responsible for the development of the International Typing Rules? When were they last revised?

- 6 In what year was the 5 word penalty changed to 10 words? Why was this change made?
- 7 In what year was the change from actual word count to the standard five stroke word made? Why was this change made?
- 8 Set up a list of advantages and a list of disadvantages of competitive contests among schools
- 9 How does J N Kimball's material differ from that of other authors?
- 10 In what ways does fatigue affect the speed work of a typist? Explain how attention to details affects the speed of a typist
- 11 Discuss the association of concentration and mental control in the building of typewriting speed
- 12 What are the two types of reading and which is used by the typist? How should the typist read his copy for best reproduction on the paper?
- 13 In reading for typing what changes are made by differences in purpose and types of material? What happens when the typist reads too much for meaning?
- 14 How far ahead should the typist read? Does the eye span influence the speed of typing? Is memory span of use in typing? If so, what?
- 15 How do the following affect the reading for typing oscillation, regression, mind wandering fixations and looking off the copy?
- 16 What other uses of reading does the typist find besides the reading of the copy to be typed? Does he use the same type of reading for all?
- 17 Are speed plateaus necessary in typing? If not, why not? How may speed plateaus be prevented? What causes the speed plateau in typing?
- 18 When should the speed problem be solved, in the early learning stages or the advanced stages? Why?
- 19 What are the purposes of practice in typing? How important is the student's attitude toward his practice?
- 20 Study carefully and discuss critically the plan for rapid speed building set up by Harold H Smith
- 21 Critically analyze the speed practice suggestions of D D Lessenberry
- 22 Compare the short timed writing and the long timed writing in at least two respects
- 23 How long must a person type before his speed can actually be measured? Why is it possible to write faster for 1 minute than for 5 minutes?
- 24 When should tests of 15 or more minutes be given? What purpose is served by these long tests?
- 25 What makes the Horn Peterson word list better material for the typist's practice than the previous lists of common words?
- 26 How important is motivation to speed development? What are the best means of motivation for speed growth?
- 27 Critically compare the rules for checking typing work suggested by the author with the International Typing Rules
- 28 What is the usual copying speed attained by fourth semester typing students? What is the average copying speed required by most business offices?

SPEED AND ITS DEVELOPMENT

29. At what rate of copying should a typist begin transcribing in order that his speed development may not be interfered with?
30. What happens to the student's speed and accuracy after he leaves school and works in a business office as a stenographer? Can you account for the change?
31. How does rhythm contribute toward the acquirement of continuity of operation?
32. How many words per minute difference should there be between a typist's copying speed and his transcribing speed?

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CHAPTER XII

The Practical Application of Skill

The Advanced Skills Stage. After the work of the first semester, fundamental typing skill should be sufficiently well developed to permit a reasonable amount of strictly automatic operation on the combination, or word, level and absolute automatism on the individual stroking level as far as all letter keys and other frequent character keys are concerned. This conclusion is, of course, subject to the exigencies of given situations. There are cases where backward students and those crowded for time must sacrifice their potential skill in favor of immediate, though lesser, knowledge and skill. During the first semester the student has passed through the keyboard learning and the continuity writing phases, yet there remains much to learn in order to use the typewriter effectively. These are the "knowledge skills" and represent the things to be learned before a mastery of the machine as a practical device to do personal and commercial work of all kinds is completed. While these "knowledge skills" are being taught, the writing rate must be further developed and the controls better established.

Many teachers do not realize that these advanced skills are quite as important as the beginning skills and, if taught well, are much harder to teach, in fact, this instruction work shows the teacher's real ability. To many teachers, it consists only of assigning plenty of exercise material, which may prove to be little more than just "busy work." The teacher may have many papers to check and few free periods in which to check them, but, if fewer exercises are required and more class time is spent in actual teaching, there will be fewer papers to check and more learning will result. In a well-conducted class, the teacher's time should be divided about equally between class instruction and indi-

vidual instruction Rarely do students encounter the same difficulties in typing exercises, straight copy, or production work, therefore, most students need some individual attention and instruction each day While considerable material is available to help the teacher in the elementary stages of training a typist, there is little that gives specific methods for training in the advanced stage of skill development It is the purpose of this chapter to provide as much help as possible for this problem

The Problem of Student Interest. It is axiomatic that students are eager to learn to type and that they generally like the typing course, but after the first semester the student knows whether he is a superior, an average, or a poor typist, and he has little hope of changing his status Therefore, more ingenuity on the part of the teacher is required to maintain student interest beyond the first semester The difficulty in arousing student interest in the college course is even greater than in high school, because college students do not respond to many of the motivating devices that can be used effectively with high school pupils The typing teacher has the satisfaction of knowing that the skills and knowledge that he teaches are useful to the student in many ways This may be an important factor in creating student interest, but it cannot be depended upon to furnish the whole solution to the interest problem

Because enrollment in advanced typing is justified only for students who plan to use it vocationally, production work must be acceptable according to office standards The advanced student should feel that a stenographer is supposed to be an expert in all matters pertaining to typing Therefore, his performance standards must require not only adequate speed but also absolute accuracy and artistic arrangement This should not only create interest but develop a pride in the general appearance of his work and correct any tendency to carelessness When production work is being done, untidy erasures, uncorrected typographical errors, poor centering, or improper arrangement should disqualify work, and the student should know the reason—it would not be tolerated in the business office Not all work should be done under pressure, but enough pressure should be used to acquaint the student with the feeling of pressure that is always present in the "try-out" for a new job He must know that the person who does the work best and in the shortest time will not only be the one hired, but also the first to win promotion later The feeling of pressure comes from the desire to

excel, and, unless the student is trained to keep calm in spite of this feeling, he will proceed to do his work without adequate planning. It is not enough to warn him to keep calm in such a situation, he must have sufficient practice and training of the right kind. The use of standards of accomplishment and individual improvement goals have proved to be effective in solving the interest problem in advanced typing. The development of vocational proficiency should be the main objective of any advanced typing course and provide the chief interest factor, especially for those students who anticipate earning their own money.

Lesson Planning for the Typewriting Teacher The more thoroughly skilled and technically trained a typewriting teacher may be, the more confidence and respect will he merit from his students, but this does not guarantee his success as a teacher. Good teaching requires careful planning and organizing of what is important for the learner to know. The degree of success in teaching will largely be determined by the extent of planning that precedes the teaching. The typing teacher must have a plan. He must have both general and specific objectives to attain. Unless these are determined in advance, the teaching and learning process moves in an aimless direction. On the basis of these predetermined objectives, the typing teacher must prepare a teaching plan that develops both manual and mental efficiency in the students.

In making a lesson plan, the teacher clarifies and organizes his own thinking about the main objectives of the lesson and the procedures to be used in reaching those objectives. If the lesson plan is to fulfill its purpose, it must be used intelligently. While it is true that the plan of a lesson should guide rather than control a teacher's activities, it is equally true that a good plan, followed faithfully, saves the time and effort of the students as well as of the teacher.

After a lesson plan has been used once, it may be saved for future reference, with notations as to its effectiveness, the time required by the class to perform the tasks included in the plan, description and evaluation of any special projects, errors most frequently made, and suggestions for revision of the plan before the material is taught again. Routine methods are not progressive, so the alert teacher will apply part or all of many new and tested methods to his particular situation without losing sight of the ultimate objectives. The first year is hard for the beginning teacher for it requires original planning. It is impossible to make usable lesson plans in typing methods courses, because

there are too many unknown things, like text to be used, kind and condition of equipment, length of class hour, and, if it be advanced typing, uncertainty regarding the work covered by the previous teacher. Experienced teachers do not need so detailed lesson plans as do beginners, but they should revise their plans each time they are used to keep objectives, materials, and procedures up to date, striving always to improve the results of their teaching through improved planning and through the improved use of plans.

The function of the lesson plan is to set up a co-ordinated, purposeful, fruitful pattern of activities for a group of learners. The teacher must build into the pattern of planned activities a certain amount of discussion, explanation, and demonstration. He must sometimes treat his class as a sort of clinic. It is not an easy thing to do, but the teacher who plans his lessons always in terms of foci of effort, purpose, and action intelligible to the learners is on the way to self-improvement. Continual thought and close observation are necessary, but the task is fascinating, for it really amounts to a continued study of the realities of learning. A teacher who has the courage and enterprise to work in this way, instead of being content to follow some set routine, will always be discovering for himself more and more about what it takes to get students to master typing quickly. The self-judgment of the learner is a dynamic stimulant and should be systematically encouraged as part of the well-planned lesson. The ideal to aim at is one in which the learner becomes as well able as the teacher to tell what is wrong, what to do about it, what is progressing successfully, and how to capitalize on success. A good lesson plan contemplates not merely an immediate pattern of activities, but also what will be happening in and to the learner a month from now. The question of how this particular planned lesson contributes to the long time sequence of growth is a vital one. The perspective itself must be clear if the lesson plan is to be effective.

The beginning teacher will find many of the new textbooks the best guide to lesson planning, for they are lesson planned. It is, therefore, recommended that the teaching plan offered by the textbook be followed faithfully the first time the text is used. If notes are kept regarding procedures and reactions to results obtained, the teacher may then be able, in future teachings of the same material, to inject some of his own ideas and methods. Because of this expert planning done by the newer textbooks, a model lesson plan is not given in this book.

How to Conduct the Advanced Class Teachers differ widely in their manner of conducting the advanced class. In a well conducted class, the students enter, get their materials ready for work, begin with a warm up or conditioning practice (like *a,sldkfjghfjkdsla*, etc.), while the teacher is taking the day's attendance. Then the practice assignment is given. It should be well chosen. Its objective will vary. Some days it will stress speed, sometimes accuracy, sometimes it will be remedial in nature. The drill period can be planned for the needs of several groups within the class, that is, some may be practicing for speed, some for accuracy, and some for improved rhythm or operative technique.

When the students begin work each day, their fingers seem awkward and some time elapses before they really get the feel of the keys and are able to work smoothly and with confidence. Psychologists call this the "relearning period." It demands some sort of practice, like the Expert's Rhythm Drill suggested above. From five to ten lines should be sufficient, with the 'early bird' to class doing the ten lines and often more. The drill that follows the warm up should be constructive, remedial, corrective, or informative in nature. The time allotted will vary, but 10 to 15 minutes should be the usual estimate for the entire drill period. It may include short timed writing some days and once a week a long timed test to measure what has been accomplished. Form work instruction and practice should follow the drill or test.

The best results are obtained in this drill work if the teacher occasionally types with the students. It adds emphasis to his instruction and prevents the teacher from becoming merely a taskmaster. While the above plan for conducting the advanced class presents a uniform routine, it need not become monotonous unless it is reduced to a mere assignment basis. Then practice becomes listless, interest fades and progress ceases. Never let the students feel that when the preliminary drill is over, they have done their practice work for the day. Some worth while individual practice may be done at the end of the hour when the time is too short to do a piece of assignment work or students have completed their work early.

Shall Budgets Be Used? There has been some controversy over whether typing assignments should be arranged in budgets. During the first semester of typing the work does not lend itself to the budget idea, so they should not be used. The budget system means handing

in a given amount of required work or typescript pertaining to one problem on a specified day each week, usually Friday or Monday. The budget system is not a way of teaching, it is just a device that may be overworked like any other. All too often, teachers use budgets without a clear idea of what they are meant to do beyond keeping students busy. If well planned and carefully directed, there are certain definite purposes that budgets are meant to accomplish. They may be used as a motivation device for practice, as a basis for analysis of errors and remedial practice, as an aid in making provision for individual differences, and as a means of developing desirable personality traits like honesty, neatness, promptness, initiative, etc. Since budgets teach students the meaning of a deadline, the plan is similar to the requirements of many business offices. If the budgets are finished before the deadline, students may be given extra jobs that are similar to overtime work in an office. This may help to convey the office production idea and to challenge each student to work to his capacity. An outline of budget assignments usually allows for overtime jobs for the ambitious student. Most teachers believe a feeling of pride is stirred within the students if the pages of typed material are clipped or bound together neatly, sheets placed in consecutive order according to the assignment, with edges even.

The budget plan emphasizes the value of budgeting time. The student is not working under nervous tension, unless, of course, he is a chronic procrastinator and waits until the last minute to do a week's work. He must rely on his own initiative, for he must solve many of the problems himself, he must read instructions carefully, either in the text or in his mimeographed assignment sheet, and then follow these instructions exactly.

The budget plan enables the teacher to organize the course into weekly units for which he may set up immediate goals. Since large units of work are more easily recorded than daily assignments, the grading work is made easier. Budgets may be graded on a quality and quantity basis, a certain amount of acceptable work being worth a specified number of points, and the number of points being graduated on a scale in proportion to the amount of work done. This permits the teacher to soon discover the enterprising, ambitious students and the lazy, careless ones. Some teachers feel their students meet the weekly budget due date more easily than the daily assignment. Some make the students feel the responsibility of doing the budget correctly and get-

ting it in on time Some believe the budget plan easier for the beginning teacher

Since budgets are usually handed in only once each week, an entire week may elapse before the teacher becomes aware of errors that could have been avoided It is quite possible for a very complete error analysis to be made on the budgets, though it is not entirely probable that one will be made It is possible, but even less probable, that some efficient remedial work will result A very real obstacle to efficient remedial work from budget analysis is that the situation in which the error is made and that in which it is corrected are entirely different The error is made in one situation by the student, it is analyzed in another situation by the teacher, and the attempt at correction is made in still another situation The likelihood of finding the proper mental and emotional connection between the error and its correction is remote Working with an overload of students and with no paid help, any average teacher will testify to the magnitude of the paper-checking job that the budget plan presents The checking of the many budgets at one time may resolve itself into an automatic routine, without error analysis or remedial work Many teachers try to lighten their work by having students check their errors, but they will miss many errors because their powers of observation are not keenly developed Many teachers find it easier to check daily papers than all the budgets at one time, hence they have returned to the daily assignment plan

Students should be trained to proofread their own work, because the business offices usually expect the typist to do his own proofreading Then the teacher's work becomes a matter of rechecking The budget system offers an opportunity for the weak student to get someone else to do his work for him If work may be done at home, students owning typewriters have an advantage over those not possessing them, and this places other students at a disadvantage

If used exclusively, the budget plan becomes uninteresting and crowds out new ideas The daily assignment plan gives more opportunity to discuss the work as it is being done, the teacher assuming the role of advisor while the student becomes his own teacher In a class taught without budgets, the student can be encouraged and taught to set his own specific or differentiating objectives and to develop his own procedures for reaching them Should he be unable or unwilling to do this, then the teacher must make suggestions to keep him from overestimating or underestimating his ability as well as suggest pro

cedures to be developed to accomplish the goals he has set. This makes the student self-directing and develops for him a marketable skill. Since the chief aim of vocational typing is to achieve a marketable skill in the handling of every feature of typing work, students should be graded principally on the evidence they can show of having achieved that skill, not on the amount of budget material they have produced. Achievement tests may be given to show what has been accomplished.

Individual differences will exist in classes taught by the daily assignment plan but the teacher will have more time to spend on the weaker students. If they cannot develop marketable ability, they should not try to raise their grades with extra copies that do not represent a *measure of business efficiency*. The teacher will need to use the time saved from checking to accomplish these things. The daily assignment plan may be so used that no student will ever have cause to be idle. Then the work may be assigned in blocks or units of material that would cover two days and sometimes three, of course the material would be related. If there is a wide range in the production ability of the students the contract or level assignment plan can be used from time to time.

It is necessary to have a timesaving method for handling the assignment papers. The best suggestion seems to be to have a folder for each student in which the corrected work is kept. It does not seem advisable to put a grade on each individual paper and return it to the student, for he may look at nothing but the grade. It is better to have the students proofread their copies. The teacher then rechecks them, discusses them with the class, and, with student help, files the corrected papers in each student's folder. If the proper filing equipment is not provided, a box of proper size for each class may be used. Each student may file his own folder, or students may take turns in filing the folders of the class. The teacher may grade blocks of work at his convenience or grade the entire set at each grading period. At the conclusion of the semester, the folder of work may be returned to the student, after grades have been made, although some teachers prefer not to return the papers to students lest dishonesty be encouraged in future classes. Only a few students will care to keep them.

Artistry in Typewriting There are many possibilities for displaying work through excellence of typographical arrangement. These facilities may be utilized by one with artistic ability. Typists must be able to

project the idea of the completed article before it is made, to see the possibilities of a certain arrangement. Artistry in typing is not turning out all the fanciful distortions of which the machine is capable, but of producing work in the most attractive form. Artistry can be exhibited in the simplest work—in a typewritten letter, in a tabulation problem with straight, well defined lines, or in a simple design worked into a border for decorative effect on a title page. Artistry enables the typist to express control.

Horizontal and vertical placement should be taught so that each student will develop the "knack" of properly arranging matter on the page. The business office cannot tolerate the wasting of bond paper to make several rewrites of badly arranged letters nor pay for the time so spent. Proper arrangement involves the correct choice of margins, the proper use of the paper edge guide, and an exact estimate for the up and-down placement. The modern typing texts contain some excellent aids to guide students in the proper choice of margins and in vertical placement. Since these charts are not always available, the student must, by their use in the classroom, learn to judge the space the material will occupy when it is written with the proper margins. He must learn to picture in his mind how the completed piece of work should look—he must learn to place work intuitively. The textbook charts should develop a judgment of material that will serve him later in the office job, when the charts should not be necessary.

During World War II, teachers of in service training activities found that few typists understood the rules governing the placement of material on the page. They had learned fixed margins and did not know why they used them. Some did not know that the setting of the paper-edge guide had anything to do with their margins. When they had to produce work on Government paper 8 by 10½ inches, they did not know what to do. This showed that a great many teachers had failed to give the essential understanding of the rules for placement of material. It would be difficult to measure the amount of time and paper wasted and the irritation caused by these typists, as well as by the hundreds of others in offices, who have not been taught to set up material according to a plan they could understand.

The principles of centering should be taught so that students will be able to center material on paper of any size on typewriter carriages of any length. Students must be able to translate horizontal inches into pica or elite spaces, and vertical inches into single, double, or triple

line spaces Students should be taught how to plan and organize material for greater clarity and more artistic appearance

In Chapter VIII, under the topic "Setting the Paper Edge Guide," is the explanation of how to center the paper to the center of the type writer writing scale Texts are apt to give margin settings for the line lengths and not tell how to determine the margins This is how it is done

If a writing line is to be 50 spaces long, subtract 50 from the whole line length (80, 85, 90, 95, 100) and divide the remainder by 2. This gives the left margin. Subtract that number representing the left margin from the whole line length, and that will be the right margin For example, using a scale length of 90 $90 - 50 = 40$ and $40 \div 2 = 20$, the left margin, and $90 - 20 = 70$, the right margin The paper would be centered at 45 and the edge guide set accordingly The work of horizontal placement will be greatly aided by knowing that ten characters are written to an inch with pica type and twelve characters to the inch with elite type Regular typing paper is $8\frac{1}{2}$ inches wide The scales of some typewriters are 85 spaces long in order that they may conform to paper width, but many see no particular advantage in this On the other, it makes the arrangement of the margins difficult The scale center must be either 42 or 43, and the stops have to be set at odd places, like 17 and 67 for a 50-space line, instead of the easier points like 20 and 70

Several methods may be used to estimate vertical placement. All are dependent on knowing that there are six single line spaces to an inch This multiplied by the length of the paper in inches will give the number of single-spaced lines that may be written on that sized paper For example, regular typing paper is 11 inches long, hence 66 single spaced lines may be written on each page A half sheet turned the long way ($5\frac{1}{2} \times 8\frac{1}{2}$) will carry 51 single spaced lines If the piece of material to be written is already set up in the line length to be used, count the number of lines in it, allowing for the blank line between paragraphs and the title, if there is one, with the blank spaces below it. Subtract this total from 66 and divide by 2. The result will be the number of the line from the top edge of the paper on which the typing would begin Should it be best to double space the material, then count the lines to be double spaced and add 1 less than that number (5 lines double spaced covers the space of 9 lines—5 plus 4), include the title and its space, subtract the total from 66, and divide by 2. Should it be neces

sary to change the line length of the material, then it is necessary to estimate the number of lines the material will make when written with this longer or shorter line. When textbook material has the stroke count given, an approximate estimate of the number of lines can be obtained by dividing the total strokes by the line length to be used. After that, the process is the same as described above. If the stroke count is not given, then determine the average number of strokes to a line, multiply this by the number of lines, divide this approximate stroke total by the line length to be used, and continue the calculation. These estimate plans take a little time, but in the end they save a great deal of time that would be spent in rewriting. The computations involved are not difficult.

Every line must be accounted for in the estimate of the number of lines. When this estimate must be found from the stroke count, only an approximate number can be computed and the placement may be a line low or high, but even this is better than a guess. Be sure that students know there is only one blank line between the lines of double spaced matter and two blank lines between triple spaced material. According to the artists, the eye finds material placed a trifle high more pleasing than when it is centered exactly. This means that material a line or two high is more artistic than if it were exactly placed. This is especially true of business letters. Be sure the student has his paper leveled with the line scale of the typewriter before he spaces down the number of times his calculation dictates.

Artistry uses and develops the student's judgment, his artistic ability, and his good taste, it also affords opportunity for his originality to function. Artistic typing should not be confused with ornamental design work. That is more or less a hobby and something that only a select few are gifted in doing, while artistic typing is essential to attractive work. Ornamental typing includes pictures, designs, and portraits, and uses cross stitch, needlepoint, and filet crochet patterns. Some ornamental typing can be used for the cover pages of manuscripts, but it should be simple. Too much "dressing up" gives an overdone appearance, hence not much emphasis is given to ornamental typing today. Borders are of three kinds: all around borders, band borders at top and bottom, and "boxes" containing the typed information, which are placed in the upper third of the cover.

Ornamental typing can be used sometimes as a motivation device. It is of interest to most students and especially interesting to a few

gifted in such work. These gifted students may be encouraged to develop their ability along this line in their spare time, but never at the sacrifice of the regular work of the course. One of the chief values of this work is that it acquaints students with uses of the typewriter that they otherwise might not learn. Ornamental typing cultivates judgment, trains the eye to measure space more accurately, and helps to develop greater artistry in other typing work. Students should be encouraged to use their originality in creating various patterns for their designs.

Teaching the Mechanics of Writing. Typing students should have learned in their English courses the correct use of the mechanics of writing—punctuation, capitalization, abbreviation, syllabication, paragraphing, and spelling. While much of the material typed is merely to be copied, yet they must know if the mechanics of writing have been correctly applied, for later in transcription and even later in their work as an office typist, this knowledge becomes of supreme importance. Some reteaching of these topics is necessary, however. The typing room must be equipped with a sufficient number of good dictionaries for checking spelling and syllabication. To avoid confusion in the minds of the students, there should be mutual agreement between the teachers of English, typing, and transcription on the rules and uses of the various mechanics of writing. Although some rules for punctuation are not vital, some rules must be known, the same rules should be taught in both English and the business subjects. Only a few simple, easily applied rules are needed.

The correct division of words into syllables is a matter of great importance because it helps in maintaining an even right margin—a mark of a good typist. The evenness of margin depends largely upon the margins chosen for each piece of work. If the line length used is either too short or too long, frequent syllabication of words is necessary to keep the right margin reasonably even. The typist should try to avoid dividing words wherever possible because several lines ending with hyphens produce a bad appearance. The study of syllabication will make the student more pronunciation-conscious. Some teachers believe the memorizing of fixed rules will not prove so serviceable as a knowledge of correct pronunciation. A general rule says "Divide words according to pronunciation (the American system), not according to derivation (the English system)." But pronunciation will serve only in a timed writing, and the student must know how to use intelli-

gently the dictionary for syllabication purposes. The student may become familiar with a few easily applied rules and then use the dictionary only for the occasionally puzzling word. A helpful set of rules for dividing words may be found in the *Business Education World*, for November, 1943.¹

Teach Composing at the Typewriter. Composing is an art that can be taught to the beginning typist; if it is not taught then, it should be a part of the skill-application work of advanced typing. It is difficult for many typists however, so its training should be begun during the early learning stages. Some feel that the difficulty is due to the inability of students to think. Composing at the typewriter is really thinking at the typewriter and may be called thought-typing. Unfortunately, it has been true that the average typist is prepared to type only from copy and is not trained in the reaction set up by stimuli other than the sight of letters or words.

There is plenty of evidence of the need for training in thought-typing. Frequently, the claim is made that one can think better when writing by hand, but this waste of time and energy should be apparent. The personal-use student finds this skill of thought-typing useful, and the secretary who must compose letters from the boss's penciled notes gives an excellent example of its use. Thought-typing is also the basis of transcription. The transcription process consists of a combination of two factors: (1) reading the shorthand notes and getting the meaning, and (2) writing the same thoughts on the typewriter. Hence, training in composing at the typewriter prior to transcription work should prove of great benefit.

The three skills—typing from sight, from sound, and from thought—have some common elements. There is some transfer of training from one to the other, but there is no identity between the stimuli of the sight of printed words and the stimuli of thoughts. There must be automatization on the word level before there is any attempt to do thought-typing. There must be the ability to type without "thinking" of the keys, in order that one may think freely of what one wants to say. This does not mean that a large vocabulary must be automatized. Since thought-typing implies that the typist does some thinking, it is difficult to teach this skill to immature students. A high degree of typing skill is required if thought is not to be hindered; so it would

¹ Ralph S. Handy, "The Teaching of Syllabication," *Business Education World*, November, 1943.

seem best to do most of the training during the advanced course. A teacher should not be discouraged if some students seem to develop no skill in it.

There are several ways to train students to compose at the typewriter. Students may recopy and reorganize class and library notes and prepare outlines for themes and reports at the typewriter. General questions that can be answered in essay form may be asked with the first copy handed in. They may be asked to compose a short paragraph on some subject chosen by the teacher or student, much as in an English class. During the work on letter writing, they may compose business or personal letters. For this work, the use of partial notes may be permitted, so that the student does not lose typing time in deliberating. Arrangement on the page should take a secondary place, yielding to the mastery of the major skill of recording thought. Machine composition test papers should be checked for errors in spelling, general typing style or form, sentence construction, punctuation, as well as typographical errors. This work should be assigned at various intervals throughout the entire course. Not a great deal of time should be spent at one time in this work, but some practice now and then will serve as motivation for interest and practical value as well.

Teaching the Advanced Forms. The advanced forms are taught mostly during the second year of typing. Their teaching must be preceded by foundational work during the first year. This consists of the development of straight writing skill to speed the work, the use of the various timesaving devices of the typewriter, a knowledge of the mechanics of writing, skill in the art of placement, both horizontal and vertical, and the ability to set up all the business letter forms in general use. Some of the simpler phases of manuscript work and tabulation can also be taught during the first year, but the *real* work of setting up a manuscript and doing statistical work must be taught during the second year. In the personal use course, but little time should be spent on business letter work, in order to provide time during the second semester for a fairly complete treatment of manuscript typing, which is the most useful of the knowledge skills for personal use students. Some practice in handwritten drafts can also be taught during the second semester in the personal use course. In the vocational course, some practice in typing from handwriting and simple corrected typing drafts can be done in the first year, leaving the more difficult rough-draft work for the second year. It is well to give the

advanced vocational student an opportunity to build up some speed in doing such work by some timed efforts

Modern textbooks contain excellent and complete explanations and directions for typing these forms, and hence an extended treatment of their teaching is not necessary. It is recommended that the teacher study the text material carefully for it was prepared by authorities on the subject.

Teaching the Business Letter The interest value of the business-letter work for the typing student should lie in its utility. No other phase of the typing course can claim such importance. To the business man, the mechanical work of a letter—its form, arrangement, and appearance—is a detail that he leaves entirely to the stenographer. If it is done right, it is the last thing he considers, but if it is done wrong, it may cost the typist her job. To be able to type a letter that is mechanically perfect, and do it quickly, is a fundamental accomplishment. The theory of the arrangement of a letter is not difficult to learn, but the ability to perform the work so that it meets business requirements can be acquired only after much study and practice. Therefore, the ultimate goal of the typing course is to train students who can accurately write, attractively arrange, correctly spell, paragraph, and punctuate business letters.

This phase of applied typing skill ought not to be begun until fundamental typing skill is sufficiently well developed to permit a reasonable amount of strictly automatic operation on the combination or word, level and absolute automatism on the individual stroking level. The progress of this work will be speeded if the student has developed the ease of operation and the high degree of accuracy that strictly automatic operation gives. Therefore, it is customary to defer the actual work in business letters to the second semester, while the more difficult letter forms may be taught during the second year of typing.

Letters are of two types: (1) personal, and (2) business. Personal letters are simpler and more informal in their approach. The business letter is more formal, as befits its mission, and carries its message in the way most people expect to be addressed about business matters. From the standpoint of mechanics, business letters naturally divide themselves into four classes: the short letter (100 words or less), the average length letter (100 to 200 words), the long letter (200 to 300 words), and the two page letter (over 300 words). The line length and vertical placement of the individual letter vary with its length.

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Teaching the Advanced Forms The advanced forms are taught mostly during the second year of typing. Their teaching must be preceded by foundational work during the first year. This consists of the development of straight writing skill to speed the work, the use of the various timesaving devices of the typewriter, a knowledge of the mechanics of writing skill in the art of placement both horizontal and vertical, and the ability to set up all the business letter forms in general use. Some of the simpler phases of manuscript work and tabulation can also be taught during the first year, but the *real* work of setting up a manuscript and doing statistical work must be taught during the second year. In the personal use course but little time should be spent on business letter work, in order to provide time during the second semester for a fairly complete treatment of manuscript typing which is the most useful of the knowledge skills for personal use students. Some practice in handwritten drafts can also be taught during the second semester in the personal use course. In the vocational course, some practice in typing from handwriting and simple corrected typing drafts can be done in the first year, leaving the more difficult rough draft work for the second year. It is well to give the

advanced vocational student an opportunity to build up some speed in doing such work by some timed efforts

Modern textbooks contain excellent and complete explanations and directions for typing these forms, and hence an extended treatment of their teaching is not necessary. It is recommended that the teacher study the text material carefully for it was prepared by authorities on the subject.

Teaching the Business Letter. The interest value of the business letter work for the typing student should lie in its utility. No other phase of the typing course can claim such importance. To the business man, the mechanical work of a letter—its form, arrangement, and appearance—is a detail that he leaves entirely to the stenographer. If it is done right, it is the last thing he considers, but if it is done wrong it may cost the typist her job. To be able to type a letter that is mechanically perfect, and do it quickly, is a fundamental accomplishment. The theory of the arrangement of a letter is not difficult to learn, but the ability to perform the work so that it meets business requirements can be acquired only after much study and practice. Therefore the ultimate goal of the typing course is to train students who can accurately write, attractively arrange, correctly spell, paragraph, and punctuate business letters.

This phase of applied typing skill ought not to be begun until fundamental typing skill is sufficiently well developed to permit a reasonable amount of strictly automatic operation on the combination, or word, level and absolute automatism on the individual stroking level. The progress of this work will be speeded if the student has developed the ease of operation and the high degree of accuracy that strictly automatic operation gives. Therefore, it is customary to defer the actual work in business letters to the second semester, while the more difficult letter forms may be taught during the second year of typing.

Letters are of two types (1) personal, and (2) business. Personal letters are simpler and more informal in their approach. The business letter is more formal, as befits its mission, and carries its message in the way most people expect to be addressed about business matters. From the standpoint of mechanics business letters naturally divide themselves into four classes: the short letter (100 words or less), the average length letter (100 to 200 words), the long letter (200 to 300 words), and the two page letter (over 300 words). The line length and vertical placement of the individual letter vary with its length.

It is seldom that two letters are exactly the same length, and the arrangement of each presents a different problem. Each letter must be arranged in the form best suited to it and the principles of artistic balance. A letter should never present a crowded appearance. The shorter the letter, the wider should be the margins surrounding it. On short and average-length letters, the top and bottom margins may be wider than the side margins, decreasing in width as the letter lengthens until in the two page letter the bottom margin is equal to the side margins.

Most business letters are single spaced because single spacing seems to make a more artistic letter. A few firms use double spacing for their very short letters, and some double space the body of a very short letter. Triple spacing is sometimes used for an extremely short letter on a full sized sheet of paper, but this is not a common practice.

There are too many variable factors in letter arrangement to make it possible to place letters on the page perfectly by rule, by simple calculations, or by placement charts. The best thing to do is to develop a feeling for what constitutes artistic arrangement, using one's imagination and trying to visualize how the letter will look on the page before starting to type it. No matter what scheme is used for determining the placement of letters on the page, the placement will be only approximately correct. Adjustment must be made for such factors as varying lengths of lines, varying number of lines in the inside address, number of paragraphs, number of lines in the signature, special lines, like attention and subject lines. Since there will not be time to count the words in every letter typed, nor will a placement chart always be within easy reach, the student should learn to visualize the finished letter before it is typed. When the letter is completed, he should study it and determine why it did not work out as planned, if that be the result.

There is a definite trend toward the use of elite type machines because the smaller type saves space, makes a better looking letter, is more readable, is preferable in the preparation of long reports, and produces neat looking correspondence. Students therefore must be taught how to place a letter written with elite type as well as written with pica type, for each offers a separate problem. The student who learns that he must type a long letter with a 60-space line on his pica type machine in the classroom is likely to produce an unattractive, long, slender letter on his elite type machine in the business office.

Unfortunately, much of the student's business letter work is done on plain paper, when his office job will require the letter to be written on a letterhead. Many teachers try to solve the difficulty by allowing 2 inches for the letterhead. Some teachers feel that the letterheads in the workbook for the text meet the need, while others find that students spoil these and then must use the plain paper after all. It is of vital importance that each student be given practice in placing letters of varied lengths on various types of letterheads, else he will spoil too much stationery when he begins work in his office job. It is, therefore, essential that during the discussion of letter placement a variety of letterheads be studied and that the student be allowed to express opinions as to the most artistic placement of the date and the letter itself on each style of letterhead. While a majority of firms still use the standard size (8½ by 11) letterheads for ordinary correspondence the narrower, shorter stationery is favored in many business offices for short or semipersonal letters and for certain types of sales letters. Some types of letterheads have a band of printing down the left side of the paper, this, added to the deep top heading results in a placement problem similar to the small sized sheet. A striking change from the usual black and white letterhead is the use of colored ink in printing the letterhead. When this is done, a unified effect may be obtained by using a typewriter ribbon of the same color for the typed letter.

The letter placement table or chart is the most commonly used device in letter work, but it is really limited in its application. It works well for single spaced, whole sheet letters but if any double spacing is used, then complications result. Letterheads vary in depth from 1 to 3 inches and paper varies in size. Thus considerable adjustment of the table is necessary. Each textbook offers its version of what it considers a workable plan for letter placement. Most of these plans work perfectly for single spaced letters on plain paper but fail utterly when double spacing is used or the letter is written on letterhead stationery. The table on page 282, developed by the author, is an example. Adjustments are necessary for each extra line in the letter, for extra paragraphs, for a double spaced body, or for the elimination of the writer's address in the heading.

While the standard forms are first being taught, it seems advisable to use some table like this one and plain paper and then follow this with practice on letterhead stationery. By that time the student will have become familiar enough with letter writing to make the adjust

LETTER PLACEMENT TABLE

(For single spacing and pica type)

Number of Words in Body of Letter (By actual word count)	50	75	100	125	150	175	200	225 to 300
Number of line spaces from Top of paper to date line	15	14	13	12	12	11	11	10-8
Date line to inside address	8	8	6	6	6	4	4	4
Line length for body of letter	40	40	50	50	50	60	60	60
Average number of paragraphs	2	2	3	3	3	4	4	4

ments necessary, or, better still, will have developed the judgment required to permit him to abandon the crutch of a table. But what will he do when he must set up a letter from shorthand notes? That presents the greatest problem. In the *Business Education World* for September, 1942, a simple letter-placement guide was presented by Marsdon A. Sherman that he declared to be "almost infallible".¹ It is easily remembered, adaptable to either pica- or elite type machines, and with one additional step may be used for shorthand transcription. Mr. Sherman takes credit only for its name, "The Rule of 27," for it was really evolved by several teachers.

Another device for guiding placement of letters is the use of an "underneath" visual guide. Several of these have been published (*Gregg Writer*, February, 1950, *The Business Education World*, April, 1951), but all work on the same principle—that a visual guide simplifies placement problems for beginners and gives them a basis for better judgment. These guides are recommended for use during the first week in letter writing and again when transcription is first taught. Thereafter, the student should be "weaned" from such crutches. Its value lies in getting students started in good placement and in developing a placement "sense." The teacher can duplicate enough copies so each student may have his own to use. It is based on the actual word count in the letter. The guide assures proper placement, so that the student develops good judgment—at least to the extent of knowing what well placed letters look like.

¹ Marsdon A. Sherman, "The Rule of 27," *Business Education World*, September, 1942.

Students should be taught to do their work intelligently. The understanding of the reasons behind rules and forms results in respect for them and the ability to use them. To illustrate, the typist who understands that "Enclosure" on a letter is placed below the reference initials so that it can be seen at a glance by the mail clerk dispatching the letter, is not likely to place "Enclosure" above the reference initials; neither will the typist who understands the importance of reference initials in tracing responsibility for a letter be careless in recording the initials of the dictator and typist.

The teaching process for such instruction should follow the natural learning process, that is, getting the idea (presentation), applying it (practice), and testing the accuracy and thoroughness with which the individual does this practice. This necessitates the breaking down of the whole problem into simple parts, the introduction of one new thing as each preceding point is mastered, and the constant integration of the ability to handle all varieties of forms successfully. Do not jump from one form to the other, or the students will master none. The logical method is to begin with a simple form, the teacher explaining and discussing a model letter. Then students should write a copy of it and next set up unarranged material in that same form until the power of correct visualization and execution is developed. The form can then be expanded or varied as seems best, with practice first on the model, constructive power practice following. The student should be encouraged to write complete copies, edit them, and then rewrite for a more accurate copy. If he is not sure of the correctness of the form, it should be submitted to the teacher, who should look it over in the presence of the student, criticizing it from the standpoint of form, spelling, punctuation, and capitalization, as well as placement and typographical errors.

Manuscript Typing Manuscript typing has been broadened to include not only articles of one or more pages, but also outlining reports, invitations, library cards, and many things that are a part of a personal use course in typewriting. The typed form of a manuscript should follow the generally accepted practices with regard to the artistic arrangement and the correct styling of the subject matter. A combination of simplicity and neatness is desirable in manuscript work, so that the reader may easily interpret the matter. The elements that contribute most to the attractiveness of manuscript work are clean type, even and regular margins, neat erasures (if erasing be necessary)

correct spelling, consistent punctuation, skillful paragraphing, good-quality paper, accurate work, and good taste in arrangement. Simple designing may be used on title pages, but fancy borders or decorative work is bad taste.

It is suggested that teachers study carefully the models and explanations offered in more than one textbook to insure the teaching of correctness of form. There is much to know about setting up typewritten manuscripts. There are several good manuals of style, and the teacher should have one for reference. In the personal-use course, programs, invitations, card-index recipes, menus, radio schedules and scripts, and parts of plays should be taught. These may not be found in the text, but the teacher can post models on the bulletin board.

Rough Drafts. It is often necessary to revise and rewrite important letters or manuscripts several times. In such cases, it is customary for the author to write by hand or dictate the original form and then to revise the copies as often as is necessary to get the desired results. These preliminary copies are called "rough drafts." The typist recopies them, making all revisions, corrections, and insertions. In many offices, much of the work of the typist consists of typing "clean" copies of just such work. This is slow and difficult work because of the corrections.

A knowledge of the signs that printers use in proofreading will be of great value to the office worker in correcting rough drafts. A full list of these proofreader's marks will be found in any unabridged dictionary. The advanced typist should learn the meanings of these marks and be able to follow the instructions intelligently when necessary.

Before starting to type a rough draft, the typist should read it carefully and make sure that all changes and corrections are known. If any are not, the typist should clear up questions and not depend too much on his own interpretation of the revision. When the rewriting begins, he should proceed cautiously, punctuating carefully, spelling out all abbreviations, paragraphing properly, and making corrections indicated.

Sometimes the business executive writes important letters or articles in longhand instead of dictating the material to a stenographer. Although much of this handwriting may be more or less illegible, the typist must be able to read and type it accurately without consuming too much time. Therefore, students should have practice now and then during their advanced typing in copying from handwriting other than their own. Both handwritten articles and typewritten rough drafts

should be done during the class period and often under test conditions

Teaching Tabulation It is often necessary to arrange material in column rather than in paragraph form, to make it easier for the reader to get at facts, to make comparisons, or to make relationships stand out clearly This is called tabulation Tabulation must be planned carefully, so that it is easy to read, it must be well balanced on the page, so that it will be attractive to the eye Sometimes the material for the tabulation is unarranged, therefore, the ability to arrange material artistically and organize it intelligently is important Every piece of tabulation is an individual problem, hence the solution of its several parts is its most important phase

While tabulation is a vitally important part of most jobs in the business office, seldom is any of this matter given to the typist in unarranged or paragraph form, as was originally supposed Material is usually written out in pencil or ink by supervisors or department heads in the general form they think is best This leaves little for the typist to supply as to form Where the setup is somewhat involved, a rough sketch may be supplied Because practice on unarranged material varies so widely, only a few copies of such work need be given even though the text might include more It provides training whether students ever find it useful in their office jobs or not and it shows their understanding of the content of such material

The development of skill in tabulation is sometimes a problem Some of the reasons commonly advanced are the student's inability to visualize, the student's inability to perform simple mathematical computations, and the student's inability to think and plan Its practice work must be intelligently directed and properly applied if students are to acquire the requisite degree of skill in this important phase of applied typing Proper graduation of the work is essential Some experience with all the common forms of tabulation should be afforded each student during the two year course They should be prepared for the work of tabulation by relating it to the simple problems from which it grows and upon which it has its basis in form and solution Tabulation involves development of the fundamental skills and knowledges that have already been mastered and applied When any topic can be presented as an adaptation of a previously taught topic, unnecessary headaches may be avoided as well as the mastery of the whole range of the topic strengthened

The use of the tabulator should begin when the student first has need to indent paragraphs. Other stops of the tabulator should be taught as the need arises. Gradually, the student will discover the true worth of the tabulating device. The teaching of tabulation or column work should never be given students "all in one dose," as was done in the older textbooks. Tabulation work interferes with the development of continuity of writing, which promotes speed, therefore, it should be taught at periods when speed training is at a lower ebb.

The tabulation work should proceed progressively, beginning with the simplest work during the second half of the first semester perhaps, and proceeding to the most complex work during the fourth semester. The teacher must keep the explanations clear and have the work progress so that each step ties up with those previously learned. Students will then derive a feeling of achievement from the beginning, and they will find the work interesting and easier.

When a work plan is prepared before a tabulation is actually begun, then all calculations are proved and all stops are set before the typing is begun. Then the work can proceed according to the plan. There are three methods of calculating tabulated matter: (1) arbitrary selection of the line length, (2) arbitrary selection of the space between columns, and (3) basing the solution on the line length or the width of the paper. The first plan is used when the line length can be readily chosen from the total required spaces. The second plan is used when the total required spaces do not lend themselves to the use of one of the standard line lengths, so that the intercolumn spaces must be chosen. The third plan should be used when the total required spaces is determined by a large number of columns or especially wide columns, or when it is necessary to use paper wider than 8½ inches.

There are four methods for the planning of tabulations. No doubt, experienced teachers have their favorite plan, which they understand and therefore may be loath to change. These methods are:

1. The Bracket Method, sometimes called the "diagram" or "sketch" plan, is the plan that teachers have used longest. Its chief advantage is that it provides an opportunity for students to double-check the accuracy of their computation before they begin to type. Its disadvantages are the complexity of its involved computations, the time it requires, the ease of omitting steps, and the difficulty in selecting the right one of the three phases of the plan.

2. The Judgment Method resulted from rebellion against the com

plicated arithmetical process of the bracket method. It came as a response to the opinion that stenographers do not stop to figure out a placement problem exactly—they guess. Therefore they should be trained to guess at tabulation. This judgment technique may be sufficient for those who have a good perception plus the ability to generalize, but most students do not possess this. One would need to type a great many pieces of tabulation in order to develop an adequate basis for good guessing.

3 The Thumb Space Method discards the brackets and uses the space bar as a computing aid. At the end of this cross column computation, the line length required for the table is shown on the scale and the two margins may then be set with the column tabulator stops set by the usual method. This method is an improvement over the bracket method, in that it requires no diagram or plan on paper and calls for fairly direct action that is easy to remember. It is logical and time saving. The method does not lend itself to adaptation for other arrangement plans. It requires a predetermined "guessed" intercolumn blank space. It is difficult to apply to tabulation in the body of a letter where margins themselves are already determined or where the intercolumn blank spaces and outside margins should be equal.

4 The Backspace Method is the ultimate in simplicity. It is the newest of the four methods. Just who is responsible for it is not known, but the first article to set forth its advantages and operation was written by Kaiser Gordon in 1937.¹ In 1946 Alan C. Lloyd began to advocate it in the *Gregg Writer*.² Mr. Gordon called it the "backspace-centering" method. Doctor Lloyd first called it tabulation without arithmetic³ and later the Verifast Method. An adaptation of the method was called the Superfast Method. Since it is more suggestive, Backspace Method is used by most teachers. Mrs. Katherine Humphrey has developed some ways of adapting the method to solve other problems.³ The chief disadvantage of the method as originally presented was that no provision was made for adapting the procedure to situations in which margins were predetermined or in which it was desired that the margins and intercolumn blank spaces be equal. Mrs. Humphrey has done that in her article. The plan has the great advantage of simplicity in

¹ Kaiser Gordon "Teaching Tabulation as Centering" *Business Education World* June 1937 pages 775-777

² Alan C. Lloyd "Tabulation Without Arithmetic" *The Gregg Writer* December 1946 pages 180-182

³ Mrs. Katherine Humphrey "Tabulation Backspace Technique Is Faster Better" *Business Education World* February 1950 pages 298-300

that it puts to use the backspacing technique with which the students are already familiar, and in that every step actually places the printing indicator in the proper position without any backtracking

Typing the Miscellaneous Forms. The vocational student should know how to write or fill in many forms that are used in business, such as checks, receipts, postal cards, index cards, promissory notes, vouchers, drafts, bills of lading, credit memorandums, payrolls, payroll distribution sheets, requisitions, telegrams, cablegrams, radiograms, and bills and invoices of all kinds. Some of these afford excellent practice in fill in work, others give practice in simple tabulation, many of them aid in developing a business understanding that will be of value to the student when his work in the business office begins. Unless the textbook provides a workbook with blank forms, the student gets little actual experience typing these on blank paper that he has tried to make look like the actual form.

For many years legal work comprised an important part of the typing course, but in recent years it has been the general opinion that it is unnecessary to teach all the legal documents—just a few to give a general idea of the form and terminology used.

Legal forms vary from locality to locality, and even from office to office, hence legal work done in school has little bearing on the work that may be done in an office. Outside the business office, much of the legal work consists of filling in printed forms with the aid of the variable line spacer. Since standard requirements in offices vary so much, only a very general training that can be adapted to the office situation seems wise. This applies also to technical papers. The form of all technical papers depends on the individual employer and his needs. Building specifications, articles of agreement, estimates, and financial reports occupy a relatively similar position. A few of these are excellent for the experience they give the student, but they should not be overemphasized. The styles of technical papers are more flexible than those of purely legal documents. Both style and content are important in these documents, because the papers may be used as evidence in court. The printed forms are used to save time and to insure the legality of the paper, but if a document does not fit a situation, one is typed in full. Such papers must be typed correctly and without erasures. Many attorneys and government departments refuse to accept them if they contain erasures, or they require that changes and erasures be initialed by all parties.

Instruction Versus Preparation for the Job The modern view of education requires that the student shall have some idea of the use he will make of his work. This is partly for its motivating value and partly for its general vocational and life values. In the many forms that must be taught to the advanced typist, the teacher must continually strive to differentiate between the student's need for instruction and practice in the technique of performance and his need for working under production conditions and toward production standards. Instructions should always precede production practice, but sufficient production practice should be provided to insure a reasonable amount of practical skill on the job. In no part of the typing course is it so important to maintain a balance between the objectives of instruction and production as in the work of skill application.

Since the greatest justification for typing lies in its vocational aspect of training for the typing job, the school must accept the responsibility for seeing to it that the prospective typist receives adequate training for his future job. The kinds and degrees of skill a student needs to acquire in school must necessarily depend on whether or not he is likely to require those particular kinds and degrees of skill when he leaves school, and whether their possession will contribute directly or indirectly to his progress. Therefore, the extent to which these minor skills should be stressed depends on local needs. If there is a reasonably good demand for any particular kind of skill with adequate remuneration, it should be met, but not materially exceeded. If there is no demand, a little knowledge will usually suffice. More and more schools are finding it expedient and necessary to add to their equipment the various machines so useful in the business offices in their areas. If their expense is to be justified, students must develop skill in their use.

Production Standards An important thing for all teachers to keep in mind is that efficient management in industry requires the attainment of practical standards. The ideal standard is generally too expensive and impractical. The business office does not require perfection so how can the school justify it? If a mathematical device is used in determining placement, the student should not come to depend entirely upon it. He must, in the end, develop the ability to judge with reasonable accuracy how his finished page will look.

There are fairly definite standards, in terms of output, that are expected by businessmen. The term "output" is really a combination of two of the factors of skill—speed and fluency. The typist who can

arrange business letters in acceptable form at a rate of 25 to 40 words per minute is probably typing at a gross speed of 40 to 60 words per minute, but his fluency is necessarily broken by the movements required for setting the machine at the proper points to insure artistic and formal placement. If transcribing, other obstacles to fluency appear

The skill factor, accuracy, weighs heavily in the businessman's standard of performance. A letter is usable, mailable, or unusable. The measurement of accuracy demands that, except now and then for intensive accuracy practice, the eraser should be used. Each student should have his own dictionary to save time and be responsible for the proper spelling and syllabication of words.

In attempting to develop the production standard of skill, the need for duplicating the working conditions of the business office must be recognized. This means that in checking the typist's output the finished letter, and not a part of it, should be used as the basis of computation. The letters should vary as to length and hence as to placement on the sheet. Any other method of calculating output is artificial and misleads both teacher and student. The teaching process required for attaining good output with a practical degree of accuracy is similar in principle to that which has already been described for acquiring basic copying skill. At first, the single letter will be the basis of the intensive effort for output, for usability, or for both. Later, more sustained efforts and greater diversity of form and placement will supplant the single letter efforts. *These efforts may be introduced as soon as complete knowledge has been acquired as to a particular form, or they may be left until the second year for those who will become stenographers.*

Some teachers use the plan of requiring that a certain percentage of letters assigned be submitted in mailable form within a given practice period if the student is to receive a satisfactory mark. This percentage increases rather rapidly, thus throwing more stress upon accuracy. This is a good plan provided certain practice periods are set aside for the further development of basic typing skill. Without such precaution, the student will slow down and abandon whatever fluency he has acquired because accuracy becomes overly emphasized as an aim. This is enforcing production standards without regard to instruction standards. In short courses it is often justified, but it cannot be justified in regular courses. It prevents the typist from realizing his greatest potentialities in output.

In conclusion, it should be said that there is available no satisfactory system of measuring the typist's progress in developing skills of a practical nature. Such a plan would be difficult to construct, the chief obstacle being in arriving at the proper unit of measurement. It cannot be the letter, because that varies in length and in arrangement, nor the word, for that does not consider the element of arrangement. In an article, Mrs Katherine Humphrey says

The development of speed and skill in production work in advanced typing classes can be greatly stimulated by setting individual goals in each kind of work for each student. Where abilities vary widely as they do in advanced typing classes, such an adjustment of standards to individual abilities is virtually a must for good teaching.¹

Perhaps someone will work it out sometime in the future

CLASS DISCUSSION QUESTIONS

- 1 Why is it advisable for the student to develop a certain level of fundamental skill before he attempts the application of skill? What is this level?
- 2 Compare the interest problem of the first semester with the problem of the other three semesters
- 3 What is the function of the lesson plan? What are the steps necessary for making a good lesson plan?
- 4 According to James L. Mursell what are the chief characteristics of an effective lesson plan? Could these be modified?
- 5 Outline a good daily plan for teaching the beginning class. A good weekly plan for the advanced typing class
- 6 Set up as many advantages and disadvantages as you can for the use of budgets in advanced typing
- 7 Anticipate several situations that might arise in teaching the form work of the second semester, the third semester and the fourth semester and discuss ways of meeting such situations
- 8 Why is it not advisable for the advanced classes to choose the material and direct their own warming up and skill practice each day? Why should the teacher carefully plan this?
- 9 How important is artistry to typed material? Can all students expect to excel in this phase of the work?
- 10 How can the student's ability to compose on the typewriter be developed?
- 11 How can the student's ability to take dictation direct to the typewriter be developed?

¹ Mrs Katherine Humphrey, *Handicap Hurdles for Production World*, *Business Education World*, May 1947

- 12 If the various headlines of an article have different values, will the first line always be the first value line?
- 13 Give two uses of each of the following and the rule that governs its use in typed material period, comma, semicolon, colon, hyphen, quotation marks, apostrophe, parentheses, underscore, capitalization, abbreviation, and syllabication
- 14 What foundational preparation should students have for business-letter work in typewriting?
- 15 What salutations are used in business letters? Differentiate between their uses
- 16 What complimentary closes may be used for business letters? Differentiate between their uses
- 17 What are the most commonly used business letter forms? Which one is used most? How does the personal letter differ from the business letter?
- 18 What are the parts of a business letter? Which are sometimes omitted?
- 19 What is meant by a simplified letter? Why is it favored by business and opposed by teachers of English?
- 20 Discuss the advantages of and objections to the absence of punctuation in business letters Distinguish between open and close punctuation
- 21 When should a letter be sent to the attention of an individual? What are the advantages of this practice? At what place may the attention line be placed on letters and on envelopes?
- 22 What are the advantages and uses of a subject line at the beginning of a business letter?
- 23 What are the different sizes of envelopes used for business letters?
- 24 Describe the proper method of folding a business letter What changes in folding must be made if a window envelope is to be used?
- 25 Give five rules for syllabifying words that can be easily learned and applied How can words be syllabified quickly in a test?
- 26 Why is erasing on legal documents not advisable? If an error is made, in what two ways can it be corrected without erasing?
- 27 Name the five most commonly used legal documents and tell how they differ in their typed form
- 28 Study and discuss the tabulation work in several modern typing manuals How important is a good plan to the typing of tabulated matter?
- 29 What is meant by the "production emphasis"? How valuable is it that the advanced typewriting student work under production conditions and strive to attain production standards?
- 30 Compare the production standards set up by various business firms and organizations

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CHAPTER XIII

The Testing Program for Typewriting

The Purpose of Tests Tests have much the same purpose in a school that they have in an industry. The manufacturer makes frequent tests for three purposes: (1) to make sure that the raw material being used conforms to the specifications set up, (2) to make sure that every operation is being carried out as planned, and (3) to detect any inefficient performance on the part of a worker. When any test reveals that one of these three is not up to par, steps are taken at once to correct the failure.

In schools, judgments of students' achievement or intelligence or personal qualities are constantly being made by teachers. Every judgment made of a student is a measurement. The basis of this measurement is usually a test, or a series of tests, although sometimes, unfortunately, the judgment is based on the personal opinion of the teacher. Much of the testing in schools is inadequate and ineffectual. Teachers test to fill time, and sometimes teachers test just to test.

In typing, testing may be used to measure and it may be used to teach, but it should never be used as a motivation device for higher grades. Tests have been given in typing for many years, but the kind of test used has been faulty because it has not included all the points that a good test should provide. The most commonly used type of test is the copying or speed test, which is most limited in its ability to measure and most inadequate in its power to teach. The value of a test depends on the use made of the measures. Teachers often administer

tests too late in the grade period to remedy any trouble. Sometimes they approve tests when their students' scores are high and consider them unsatisfactory when the scores are low.

The real purpose of tests in typing is to measure the results of teaching, that is, the abilities and skills which the teaching tries to develop in the students. Another way of stating the purpose is to say that testing tries to determine the extent to which the students have achieved the objectives set for them in typing. Numerous objectives have been recognized in the many statements of the aim of teaching typewriting, but it is generally agreed that among the desired outcomes of typing instruction are the development of skill and its application with the ultimate goal of success in the business world. The newest purpose to be assigned to testing is the development of speed with control. Many teachers choose to call these tests "timed writings" or "timed tests." In general, the purposes that testing in typing should serve may be summarized thus:

- 1 To discover student difficulties for remedial instruction
- 2 To promote competition between groups, between individuals and with a student's past performances or records
- 3 To determine when satisfactory levels of attainment are reached
- 4 To determine what achievement may reasonably be expected of each student in order that superior students may be held to higher levels of achievement and inferior ones not expected to do more than they are capable of doing
- 5 To stimulate students to greater activity by informing them at regular intervals of their progress
- 6 To diagnose weak spots in the student's achievements
- 7 To determine aptitudes of students for guidance purposes
- 8 To determine credits, honors, etc.
- 9 To provide a promotion basis that is more reliable than grades that are based only on subjective measures like opinion and observation
- 10 To provide a basis for reports to principal and parents
- 11 To provide a dependable basis for sectioning students according to abilities
- 12 To stimulate teachers to more effective effort by their discovery of either effective teaching or poor results

While testing is a teaching device, the teacher should never be testing when he should be teaching. Class periods should not be devoted to giving speed tests to measure nonexistent skill when the time could more profitably be spent in building technique that would develop what the test is supposed to measure. The proof of the test is in its use.

The test that proves most helpful in realizing a particular purpose is the best test for that purpose

The Standards for Testing. Measurement of the results in typing must be done in the light of established aims and objectives. As these goals are extended, the speed test becomes grossly inadequate to measure completely the success or failure of typing instruction. Yet ability to copy rapidly is only one of the aims, and frequently a student who is satisfactorily competent in this respect may be wholly incompetent as a typist who can produce a reasonable amount of usable work over a period of time and in the most accepted form.

Measurement in typing has undergone some marked changes over the years. The trend has been away from dependence on the speed test as the sole measure of student achievement and has moved toward more comprehensive tests that measure performance on various types of personal and office jobs. This wholesome tendency is bringing measurement in typing more into line with instructional objectives. The changed emphasis in testing is also exerting influence on course objectives to make them more functional.

In passing it must be recognized that the almost universal acceptance of the speed test gave to testing practices in typing a certain uniformity and standardization that were not enjoyed by other secondary school subjects. When objective testing was in its infancy in the high school, typing teachers had already achieved complete objectivity through the use of the International Typewriting Contest Rules. Teachers of typing in any part of the country could arrive at the same score on a given test paper. Speed tests were 15 minutes in length and meant straight-copy work under stress of time. That the difficulty of the material copied varied greatly from test to test and the writing conditions were not uniform gave teachers or students little concern. At least, they were all talking about the same thing, and there was complete understanding of each other—their terminology was crystallized. It is not surprising, then, that it took a great deal of effort and talk on the part of those who saw the incongruity between stated course objectives and testing practices to make any inroads upon the firmly entrenched speed test. Even now it has not been entirely dislodged from its position of pre-eminence as the sole measuring device in some classrooms.

Speed tests have their place in typing instruction, and it is difficult to envision a classroom where straight-copy tests under time, whether long or short, do not function as a learning device and, to some extent,

as a measuring device. But modern classroom technique does not depend on speed and accuracy on straight copy as the ultimate measure of achievement. Nor is there such slavish adherence to the International Typewriting Contest Rules for scoring as there once was. The time may not be far away when speed in typing will mean rate on a designated type of production work. Already the term is losing some of its universally understood meaning, and only confusion of terminology and of purpose exists at the moment. This situation should not be viewed with alarm, for any transition period is characterized by some confusion.

A learning standard is an intermediary goal that a teacher sets because he feels that its use will aid the student in achieving his ultimate objective. The speed test is such a learning standard. When a student attains a certain copying speed, he may be ready to integrate his skill into a "use" situation. One of the greatest weaknesses in the teaching of typing at any level is the failure of the teacher to substitute performance standards for learning standards when the learning standard has served its purpose. The learning standard, if properly used, has a real function in the building of typing power and should not be eliminated entirely, but teachers too often do not advance to the next phase of the teaching process—the setting of performance standards.

Learning standards should be set up as milestones along the way toward the ultimate attainment of the goals or objectives. Some of the learning standards that the typing teacher may require the student to acquire are: stroke 40 words per minute for 1-minute periods on practiced material at the end of six weeks of instruction; center three short lines of unequal length in 5 minutes; change a typewriter ribbon in 1 minute; tabulate three columns of five lines in 10 minutes; address envelopes correctly at the rate of one every 10 seconds; and type 40 words per minute for 10 minutes, making erasures to correct errors. It is obvious that none of these learning standards insures that the student can perform satisfactorily those typing activities he will encounter. On the other hand, performance standards measure the student's ability to use the typewriter efficiently. Some examples of performance standards that may be set are: type five mailable 150-word letters in half an hour with accompanying addressed envelopes; from notes compose a report on library readings in half an hour or in whatever time would be reasonable; and revise in 20 minutes a poorly arranged tabulation. The timing of student performance should be started very

early in the course and continued throughout its duration. Such timing should be used as a learning device rather than as a test.

Some work has been done on the establishment of standards and rates of production in line with office requirements. The practical difficulties are evident, but it is believed they can and will be resolved to the end that relative rates attainable on different kinds of typing jobs, and goals for each kind of job, may be established. Whether they should be uniform throughout the country is a debatable question. There is evidence that progress is being made toward determining office standards suitable for school goals. The newer tests measure diversified typing jobs and are closer to office requirements than the older ones, some are partially standardized. The development of the National Clerical Ability Tests has exerted perhaps the greatest influence upon vocational objectives. These tests are a step in the right direction but fall short in not requiring pressure work.

Testing As an Aid to Instruction. Students differ in native ability and in past experience. Some students are eye minded, some are ear minded, and still others are motor minded. These differences become prominent in their learning. Some students grasp quickly the response that is to be made by seeing another perform it, others require a detailed explanation, and still others progress more rapidly by being allowed to reason out the appropriate response. Students also differ in the amount of practice they require in order to reach a given degree of facility in performing an operation.

These conditions make the teaching situation a complex one. Before a teacher can intelligently direct his efforts, he must secure a diagnosis of his class. This means giving tests, marking the papers, and tabulating the results as the first step. The next is to interpret the results in terms of student needs, and then modify the instruction in accordance with the interpretation. As a whole, different classes have different needs and the individual members of a class have a great variety of student needs. The first step, however, in interpreting the results of a class test is to ascertain the needs that are common to the class as a whole or to large groups within the class. This should be followed by an individual interpretation of the results of those at the extremes of the group, particularly those conspicuously below standard.

Some tests have a general function, others are diagnostic. A general survey test furnishes general information, which is useful in determining the general effectiveness of the instruction. A general test serves to

locate the students who are not yet up to standard, but a more elaborate test must be used to reveal the exact nature of the shortcomings of the students. Hence teachers will find the diagnostic tests most helpful.

It must not be forgotten that any set of practice exercises is merely a teaching device. It is more important that the teacher explicitly recognize in his thinking that he is instructing a group of students who differ widely in native ability, experience, and training, that all do not learn in the same way, and that a limitation should be placed upon training. Recognizing these facts, the resourceful teacher will find many devices that will be helpful in adapting the instruction to the needs of the student.

A diagnosis cannot be made until students have had some opportunity to achieve, because achievement is measured through performance. A diagnosis with respect to achievement is, in general, impossible until instruction in the subject has been practically completed and has only a limited usefulness. Until there is agreement upon the particular educational objectives to be attained and the plan of education has been modified so that instruction will extend over a longer period of time, teachers must necessarily make their diagnosis in other ways than by the use of tests.

When one wishes to inquire into the causes for a given degree of achievement, it is necessary to consider the quality of the student material as well as the general organization of the school, the methods of instruction, and other factors that contribute to a student's achievement. A student who has little capacity to achieve cannot be expected to achieve as highly as one who has a much higher general intelligence. The same is true of classes whose average general intelligence may be unusually high. In interpreting measures of achievement of either groups or a single student, it is necessary to obtain measures of their general intelligence. While achievements in school subjects are important, yet they do not constitute the total necessary equipment. Ideals, perspectives, and attitudes are highly important controls of conduct.

The content of a test should be as nearly as possible in agreement with recognized educational objectives. The results obtained by using a test are also indicative of its value. The test should be at least as much for the sake of teaching as for the sake of measuring and marking. All good learning calls for occasional stock taking. This should

not be too frequent, but now and then there should be challenges in which the student shows all concerned, himself included, just how well he is doing. This is the time that the teacher should mark every error with the greatest care, doing it for an intelligent and reasonable purpose, and not as a matter of routine. The errors corrected ought to show the student how to learn better, how to set himself more accurately for his task, how to do his work more intelligently, because an error is a symptom or a sign that one is not using his hands, or ears, or eyes, or mind properly.

Interpreting Test Results. A single test measures a student's achievement and is a relatively small part of the total field of typing achievement. A battery or a series of correlated or related tests is more accurate. It is also true that neither a single speed test nor a single practice record can be taken as revealing the true status of the student's ability. Practice performances vary, and one who gives a number of tests will find that test performances vary also. It is therefore true that many students will do better during practice than on a test. The answer for this is that the final estimate should be based not on one record, but on many. Whenever very precise physical measurements are required, this is always done. If a dependable and valid result is to be obtained, this principle must be observed. The true ability of a student is revealed, not in a single practice or test record, but in a series of them. Just how many tests should be used is difficult to say, but perhaps three tests out of five, or a week's work, maybe more, maybe less. Dr. James L. Mursell gives some points to have in mind when one wishes to handle such data in order to get significant results. These points he has summed up as follows: "Always remember that no one performance, no one record, no one index, no one measure can ever give a true and valid picture of any type of human efficiency."¹

Neither is a single speed test the best and most certain means of selecting candidates for a job. Every expert on tests and measurements would agree with this. A far more revealing factor is the performance over a period of time on a series of occasions. The experience of a number of outstanding firms and corporations in testing employees is given by Dr. S. J. Wanous in an article, as follows:

Test results are used merely as an aid to help the employer get a clearer more accurate understanding of the applicant's fitness for office work. Em

¹James L. Mursell, "Acquiring Consistency and Dependability," *Bunness Education World*, September, 1941.

ployment standards that have been set up are stated in terms that are general. Candidates for office positions should possess common sense and judgment, they must be interested in their work and be willing learners; they must have the kind of manners and appearance that make good impressions; they must be good in spelling, punctuation, grammar, and letter writing; they must be able to type, take dictation, and transcribe their notes rapidly and accurately. If an applicant can meet these standards she will have little difficulty in obtaining office employment or in keeping her job.¹

If business education is to fulfill its primary objective, it must keep pace with the requirements and standards of business. When the school turns out a product unable to perform the duties required by the job, business pays the bill and the school faces criticism. The type of efficiency that businessmen have demanded in the past and business education has attempted to reach in normal times is well outlined in the above quotation. Four standards of efficiency—vocational, fundamentals, general information, and personality—are combined into a single statement of what comprises clerical ability.

Variations in Test Performance Any series of performances is not perfectly even. This is true of the operation of a machine, whether in a factory or your car on the highway. The variation may be very slight, but it always exists. Careful and accurate workers always make allowance for such variations, because they are inevitable. With human beings, the differences between different performances are sure to be much larger than with a well constructed machine. The degree of unreliability to be expected is considerably greater. The question is how to deal with this factor of unreliability, how to allow for it, and what to do about it.

Why is it that students who regularly type 60 words per minute on timed practice work often fail to reach 50 words per minute on a formal timed test? How true is the student's statement that he always goes to pieces on a test? If the claim that the difference in performance is due to nervousness is correct, what can be done about it? Some students work more rapidly and accurately under the stimulation of test conditions than under practice conditions. If so, what is the explanation of the apparent contradiction that one student does better under test conditions while another does worse? Even when working conditions are kept as uniform as possible, some variation is to be expected. Even under practice conditions, the student's typing speed will not always

¹ S. J. Wanous, "Tests Used and Standards Established for Employing Office Workers," *National Business Education Quarterly*, Spring 1941.

be precisely the same. But when conditions are changed, a more serious variation is to be expected. This is one of the normal phenomena of all human behavior. The wise teacher and the properly instructed student will understand that it cannot be wholly avoided.

Clearly, excessive variation is a bad thing, even though an appreciable amount of it cannot be avoided. When there are gross differences, either favorable or unfavorable, between practice performance and test performance, it is a sign that something is wrong. The learning has not been going as it should, and to that extent the teaching has failed of its purpose, and a new and revised approach is needed. How, then, can variation be reduced, and how can the kind of consistent achievement, obviously desirable, be promoted?

There are two major causes of inconsistent achievement. First, it may be, and often is, due to lack of emotional control and stability. Some students are so poorly adjusted emotionally that the least thing throws them off balance. If the teacher makes the right kind of study of the student's records, he can identify such cases by the extreme variability of their work even when conditions are held as constant as possible, as happens in a series of identical practice periods. Many students, although more stable, are still bothered and confused when conditions are altered. Still others cannot react successfully to routine. Give them a special challenge, and they will make a surprising spurt, but their usual performance is inferior. The moral is that it is impossible to think of building a skill apart from its setting in the student's personality. The capacity to type 60 words per minute is not a kind of thing in itself. It does not exist in the fingers or in the motor nerves, but in the whole body and mind of the individual. If the student can produce a good record only when everything is very favorable, his skill will not be of much use. He must acquire skill plus some measure of control. Therefore, the teaching of control and poise must be made an integral part of skill training. Bodily position is one factor to consider, but the mental poise, the mental attitude, is even more vital. A businesslike physical attitude helps a correct mental set. The ability to clear one's mind from distractions and concentrate on the job in hand can be acquired only by practice.

The second reason for variable and unreliable performance is that the student is so closely conditioned to one single situation that the least variation is very upsetting. He has a rigid, rather than a flexible, adjustment. His skill works well enough when he is given just the right

cues, but when these are lacking, he tends to go to pieces. When one tries to operate a closely conditioned, rigid skill in a new setting, the result is emotional upset. One does not wish to build a skill that will work only under a single, limited set of conditions. The way to teach for flexibility is clearly to vary conditions. This would seem to indicate that every practice routine should not be exactly the same. The introduction of timed tests from time to time will vary conditions. One of the values of timed tests might well be the fact that they are psychologically different from practice. A well placed, well organized skill may be rather limited and rigid in its initial stages, but, just as soon as one can, one should begin to accustom the student to new conditions.

The Straight Copy, or Timed Test or Writing. The value of timed tests has been discussed earlier. These straight copy, or timed, tests were divided into two kinds: short ($\frac{1}{2}$ to 5 minutes) "speed forcing" tests, which serve as a practice device for developing speed, and long (5, 10, or 15 minutes) "speed fixing" tests, which serve to develop sustained skill and to measure the speed gained by the practice of the short timed tests. The long timed tests are given less frequently (usually once a week) and the material is always straight copy. The material for short timed tests consists of words, phrases, sentences, or short paragraphs. Either kind may be competitive in its purpose, the student competing with himself, his past records, or the class.

The speed test is probably the oldest test in business education. It is traditional to express typing ability in terms of so many words written per minute. Teachers still recognize the need to measure skill in straight writing, but whether the speed test is the best measuring instrument is a question. Benefit or harm may come from the use of speed tests, depending on whether the teacher uses them with discrimination at proper intervals or with reckless disregard of their appropriate use. The speed test, if used wisely, is a means of determining objectively the student's sustained rate of writing under test conditions.

All timed writing should be competitive, the student competing with himself, his neighbor, his group (if the class be divided into fast, average, and slow), his class, or another section. Competitive tests are the most essential of all timed tests, because through them teachers can exercise a greater control of motivation and progress than through any other device. Competitive, short timed tests may be introduced

soon after students are able to type continuous matter. Timed tests of 5 minutes are the longest tests given during the first semester, and not many are necessary. The 3- and 4 minute tests will give a sufficient measure of the student's writing rate at this period in his training. With the second semester, the work of sustained effort may be begun, yet students should not be plunged into 15-minute tests at this time. Sustained effort must be developed gradually, therefore, it is recommended that the first timed efforts be 5-minute tests, and the time later lengthened to 10 minutes. With personal use students, the 10-minute test need not be used, the 5-minute test being a sufficient measure. With the beginning of the second year, much of the sustained skill will have been lost during the summer vacation. It is therefore recommended that the timed test program begin with 5-minute tests and extended to 10 minutes, when the students' skill has been revived. During the fourth semester, 10- and 15-minute tests may be used, especially if the students expect to go immediately into office positions. A few ungraded tests of 20 minutes, 25 minutes, and even a half hour may be given to develop endurance for the hours of continuous typing in the office. The long timed tests are the measure of what has been accomplished during the week, so Monday should never be a test day. On the day of the long timed test, the class period can accomplish little else except prepare for, type, correct, record, analyze, and evaluate the test. The practice before the test must be brief. Its chief objective is to achieve a definite mental set. Each student should determine his aim intelligently at the outset of this brief practice session, so as to insure the greatest possible improvement on the test that is to come. This is a most important feature of teacher activity and one that is disregarded where teachers use long timed tests as "busy work."

After the practice, the preparation is made for the test, which should give complete relaxation before the test is begun. There should be no unnecessary talking, no afterthought announcements, a minimum of entreaties or admonitions, and no excitement—just an atmosphere of cool confidence. The pause before the test need not be long or it will defeat its purpose, which is to relax nerves and muscles and create the right mental attitude for a good test. This determination of aim and the accompanying mental set should be an individual matter and not a blanket assignment for the class. Students easily learn to diagnose their needs from records and past experiences, and they are mainly interested in their own progress.

The procedure for the test may be divided into six steps. Each step will be treated separately.

1 *Preparation of the Paper* Two sheets of paper should be inserted in the machine when beginning the test, with additional sheets for a long test placed at the left of the writer, where they may be obtained instantly when needed. The paper clamps should be adjusted to hold the paper firmly. At the bottom of each page to be used, the student should make a line to indicate that he is arriving at the end of the page and must soon change the paper. There are several ways of marking the end of the page. A pencil line at the right margin an inch from the end of the page is most used, because the writer is apt to watch the right margin more.

A heading should be written on the second line from the top of the first page. The figures used at the end of the test to calculate the net speed will provide information to be filled in in the heading after the test. This is of value to the teacher in making the permanent record of the test and makes a summation of value to the student. A suggested form for the heading is

Elizabeth McKeever	Strokes	Gross Words	Errors	Net Rate
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The test should begin two spaces below this

Five blank spaces after each item will provide space to fill in the pencil figures of the results

2 *Preparation of the Machine* According to International Rules double spacing *must* be used in speed or timed tests. However, single spacing may be used for all short timed tests, double spacing for the long timed tests, to distinguish between them. According to the International Rules, a 70 space line *must* be used. When elite type is being used, the line lengths may be 70 unless all machines are elite, then an 80 space line may be used, if the work and training are not for contest purposes. There is no specification as to where the stops should be set for the above line lengths. Since the width of the right and left margins need not be considered, it is best to set the margin stops a little toward the left rather than the right, to avoid right margin trouble. The tabulator should be used for the paragraph indentations and must be set for a five space indentation.

3 *The Copy for the Test* When the machine and paper have been prepared, the copy should be passed out quickly, never face down. It is extremely important that the copy be properly placed at a good reading distance. Some use a clamp clothespin to fasten the copy to the textbook-copyholder. Arranging the copy is a part of the "get set" procedure of the test. If the student has a moment to look over the test material in a general way, the test will begin with a feeling of confidence that can promote good work. Questions regarding the material should not be answered unless some letter or word has not been printed clearly.

4 *The Starting and Stopping Signals* To avoid starting errors, the machine should be indented to the starting point of the first paragraph before the signal to begin is given, but the shift key should not be lowered. The shock of starting will often cause the shift key to be released and a small letter results. This error may destroy the morale of the student for the test. The class should not be kept waiting too long for the signal to begin the test. A case of nerves may be developed in the seconds while a class is kept on tiptoe for the starting signal. Neither is it advisable to keep the class waiting for a slow student to make a final adjustment. This is unfair to the class and puts a premium upon careless preparation. Students should be trained to make their preparations for a test rapidly and accurately. On the other hand, there is danger in starting students too soon—rushing them into the test.

A warning signal should precede the signal to start. The starting signal is most important. An emphatic "Go," shouted at the class, is a poor way to start the students on a test, for it gives too much impetus. The signal must be definite, so that the students will know when to begin. The following signals are suggested: "Ready" (pause briefly), "Begin." The students should be semirelaxed, not tense, fixing their attention on the first word or phrase of the copy.

Do not permit anything to interrupt the test. Do not walk around the room unnecessarily. Time the test accurately. Use a watch having a second hand, a stop watch, or one of the several interval timers.

The signal to stop at the end of the test is equally important. The signal should be loud enough and commanding enough so that all will hear and stop writing immediately, not finishing the word they are writing. Each letter written after time is called gives an advantage to the writer, for only three strokes need to be written to add a word. The best signal for stopping the writers is "Time."

5 *Correcting the Test* Students should be taught as soon as possible to check and calculate their timed tests. This work can begin with the first short timed tests. By the time the student is ready to write long timed tests, he should be as able to correct his tests as his teacher, perhaps. The interested student is anxious to know the result of his test as soon as time is called, so he should check his own test. It is better for the teacher to read back from the copy, slowly and clearly, while the students follow their tests. As a variation, sometimes a student may be asked to read from his paper while the teacher follows the copy carefully. Doubts about marking should be indicated by a question mark in the margin, later checked up. At the end of the paper students should complete the calculation and fill in the heading. It is recommended that an ordinary black pencil be used by the student for checking, then the teacher should use a colored pencil for rechecking, to contrast the two markings. Since ink makes a permanent mark and is apt to run, it is not recommended for checking any kind of typewriting papers.

Many teachers feel at this point that the test is finished, for the results are known. But the student's attention should be strongly fixed on the result of his labor. It should be compared with his previous performance. If possible, he should determine immediately what in his performance was good and what was "bad." Worthy satisfaction should be vividly stimulated and thoroughgoing dissatisfactions should be carefully impressed. A vital mental set toward his future progress may easily be created at this point, especially if his effort has been earnest and complete.

The student should feel that the teacher is interested in the result of his test in order to help him—not to hold it against him. Working on the basis that a student's best scores are remembered, his failures forgotten, some teachers have only those tests handed in for rechecking and record on which a certain standard was attained. This plan keeps the student working to improve his past records, his nervousness is minimized because the fear has been removed. Some teachers never recheck the tests of their students because they think they haven't time. If the test is to be used as the basis of a grade, then the teacher should recheck it, or it encourages dishonesty and carelessness on the part of the student. A student's checking should consist of a circle around the error, never a mark through it, then the teacher has an equal chance to identify the error when rechecking. The teacher should observe the

types of errors made by each student. The volume of checking should never be so great that this observation cannot be made.

6 Recording the Test It is necessary to keep records of students' tests not only for grade purposes but also to follow their progress. These records may take many forms. Three kinds are graphs, individual or class, tabulated records, and grade cards or grade book records. The regular teacher's grade record book is not conveniently planned for typing records. Cards that accompany textbooks usually do not provide space for test records, being designed for records and grades of the textbook material. Cards of the regular filing size of 3 by 5 or 4 by 6 may be used to carry a complete record of the regular timed tests on one side and any new type or special test records on the reverse. These cards, like the illustration below, should carry a semester's record of tests. When completed, they may be filed in the typing room and kept as a permanent record of achievement for recommendation purposes for a job after the student has finished school. They may be designed by the teacher to fit his teaching needs and be printed at the local printing office at a nominal cost.

Name							
Date	Time	Total Strokes	Gross Words	Errors	Net Words	Net Rate	Grade
<hr/>							

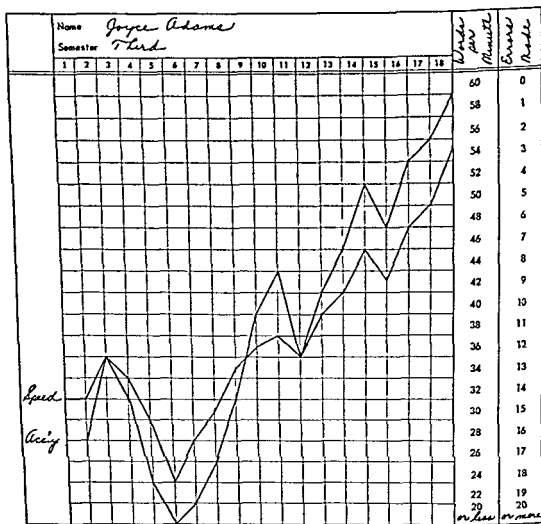
Tabulated records may be individual and kept by the student from week to week to follow his speed progress, or they may be posted on the bulletin board or printed on the blackboard. These class tabulated records show the record of each student after the teacher has rechecked the tests and are arranged in the order of the net speeds. Thus, students may see how they rank in relation to the other members of the class. The record may be divided by means of a double space into groups making net speeds within each 5-word interval. This helps students to study their ranking with others in the class. These tabulated records may be kept for future reference or comparative purposes. After students may be relied upon to perform calculations accurately,

each student may make and keep a tabulated record of all his tests, practice and graded. The following columns should be included: Date, Length of Test, Total Strokes, Gross Words, Gross Rate, Total Errors, Errors per Minute, and Net Rate. The most important of these for judging progress are the Gross Rate, which measures his output ability, the Errors per Minute, which gives a measure of his accuracy that can be compared regardless of the time, and the Net Rate, which will be of value in comparing his speed performance with that of other students. After every test of 5 or more minutes, the record sheet is inserted in the machine, after the test has been corrected, and a single line of figures typed in. This will give some excellent tabulation and fill in practice. The record will give a true picture of the student's progress if all tests, good or bad, are included. Right attitudes are an essential part of the teaching learning program. The record sheet is one of the most helpful devices for creating and controlling attitudes toward one's own progress and toward others in the group. It deserves much greater use than it enjoys. It has been found indispensable in the training of the most expert typists, therefore, its use may be recommended to the classroom student.

One of the most useful things that business has given to education is the graph. In typing, it stimulates interest, shows progress in a clear and striking way, and makes evident the features of the student's work that need attention. Typewriting graphs may be of two kinds: individual, kept by the student himself, and class, kept by the teacher or some appointed student on the blackboard or bulletin board and showing the progress of the entire group or class. The simpler a graph, the more effective it is. It is not possible to give illustrations and explanations of all the different kinds of graphs that may be used in typing, but those that are given should suggest to the teacher the possibilities in this type of record. The first two illustrations are class graphs and should need no explanation. The first graph is based on the net speed alone, while the second graph includes the total errors made on the test. Names should always be arranged alphabetically.

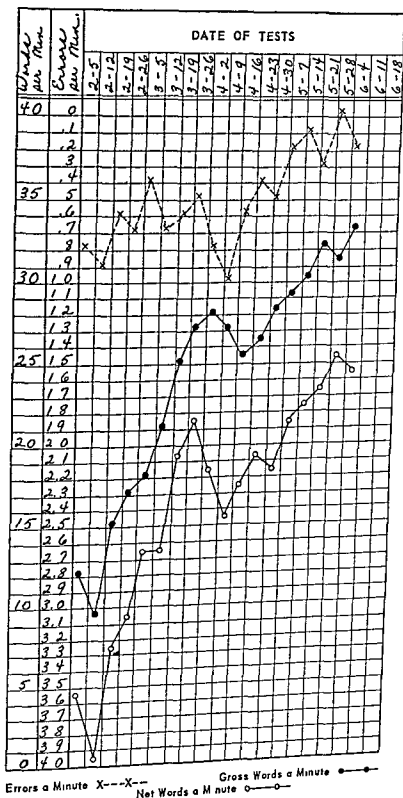
The individual graph need not be filled in during class, although it requires little time. Some teachers keep them filed in the typing room, and after the regular test each week, the student gets his graph from the file, makes his record on it, and returns it to the file. The record sheet is necessary to insure against carelessness in recording the points on the graph. The individual graph may be used almost entirely as the

basis of day to day diagnosis by teacher and student, if it is used for daily practice tests. It tells the tale vividly and in a way that no self-delusion can circumvent. The following individual graph illustrates the net speed and total errors for each test for a semester.



INDIVIDUAL SPEED CHART, BASED ON WEEKLY SPEED TESTS

Another type of individual graph is probably more interesting and useful than the one just illustrated. Each vertical column contains information about one test. Each horizontal column has three meanings—gross words per minute, net words per minute, and errors per minute. A solid, heavy line represents the gross rate, a light line the net rate, and a broken line the error rate. Two lines constitute the most effective type of graph for this purpose, but the net line has been included because many teachers have become accustomed to using it, and there

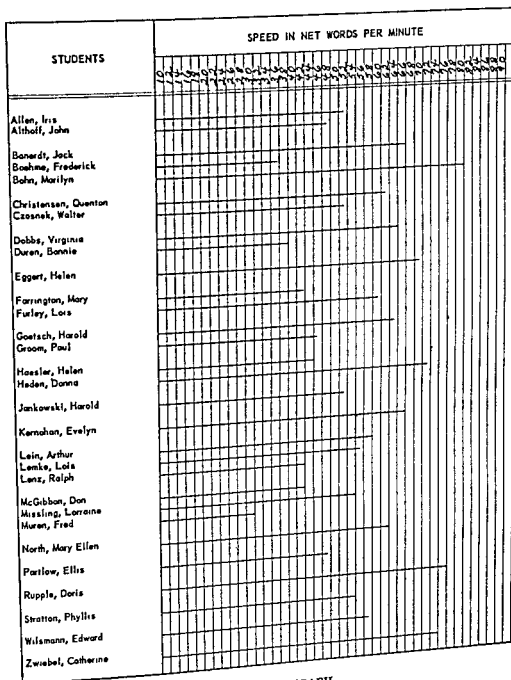


STUDENT'S PROGRESS GRAPH ON TIMED TESTS
Second Semester

are times when it is desirable to have this net speed line. It should never be used in place of the gross line, because it deprives the student of accurate information regarding one of the main elements of skill—speed. It, therefore, represents a combined speed and accuracy record, and conclusions drawn from a comparison between accuracy and net speed graphs are bound to be erroneous, and sometimes very misleading. Generally speaking, the simpler the graph, the more effective it is. Two lines constitute the most effective type of graph for this purpose, but, if desired, the net line may be added, as has been done in the illustration.

One of the basic principles of modern education centers around the problem of making the student aware at all times of the exact status of his learning progress. Volumes have been written on how to test and measure learning progress. Volumes have been written on how to test and measure learning, and on the proper use of the resultant information. The teacher must know a great deal more about typewriting skills and their acquirement than he can ever hope to tell the student, but there are certain simple, outstanding landmarks that the student can easily learn to recognize in his efforts to improve his typewriting, and it is the rare student who, having been taught these outstanding signs and their relationships, does not react with greater enthusiasm and will to improve. The greatest difficulty lies in demonstrating the value of such measurement to a teacher who does not possess much typewriting skill, and in helping him to describe to his students the simple technique of preparing and reading graphs.

In introducing graph work to the class, a few samples of record sheets and graphs should be shown the class, explanations made, questions asked, and suggestions given. Later, this will be almost entirely an individual student activity assisted occasionally by the teacher when necessary. After tests are rechecked by the teacher, they should be returned to the student, who should be encouraged to go over the errors to see what ones he failed to recognize and to look for any common error that has occurred two or more times. Wholesale analysis of every error is not to be recommended on every test, largely because it consumes too much time. The classwork should be so planned that the student can have some time to improve his technique, both mentally and manually. The guiding principle here should be to select the largest possible practice units—the phrase instead of the word, the



CLASS SPEED GRAPH

word instead of the individual letter. This improvement practice period, if enthusiastically handled, will furnish the teacher with a better insight into learning problems and lead him to develop a much better methodology and teaching technique than any other one phase of typing instruction. All the errors and lacks of early training show up here. The effect of bad habits and the difficulty of overcoming them and substituting good habits are forcibly brought to the teacher's attention, and he should find his experiences at this time most enlightening and stimulating. At this time, the student can be made acutely conscious of these shortcomings.

It is at this time that the teacher must make a supreme effort to get the student to adopt a definite criterion for daily guidance. What the student needs is a more basic understanding of his problem and the ability to set up an attitude that he can follow with confidence in the ultimate outcome. The student should strive for accuracy until he can consistently type three out of five consecutive tests with no more than one error in each 2 minutes (5 error a minute). This will establish an accuracy habit. It is then wise to strive for speed and steady, unbroken effort until accuracy decreases in three out of five consecutive tests to the point where but one error a minute is made. He may continue to strive for speed even with this measure of inaccuracy if he has thus far failed to increase his speed, until he makes two errors a minute in any one test. In any case, he should direct his attention toward accuracy, or toward speed, consistently in all his practice within the limits of this rule.

Individual graphs may be supplemented by class graphs made up on the basis of median or average performance. Where classes are pitted against each other, these are extremely helpful. It is best in such cases to record the work of two or more classes on one graph, using a different color for each class.

The Objective Scoring of Tests. An objective test is one that will yield the same score regardless of the scorer. Therefore, if all competent scorers of papers arrive at the same score for a given test, then that test is objective. One way of improving tests is to construct a test that permits only one correct answer, so that there can be no disagreement in the scoring. Spelling tests have always been objective in that there can be no disagreement on the correctness of the spelling of any word. Many phases of the work in typing may be tested and scored objectively. The traditional speed test may be objective if the rules for

checking and calculating are understood and universally agreed to by all concerned. These traditional tests have been expected to measure skill or skills. In so far as skills are the proper point of emphasis, the tests are of value, yet they are not to be considered as the sole and exclusive measure of typing ability. The finding that there was little correlation between speed in typewriting and intelligence rating has led many teachers to question the dependence upon copying or speed tests in rating students and has turned their attention to the construction of typing tests that measure other abilities. The need to measure skill and knowledge under the conditions found in the business office has been recognized. The chief difficulty has been that the tests used to supplement the speed measurements in many cases could not be scored objectively. Sometimes the method of scoring was too difficult and involved for practical use in the classroom.

Many of the forms taught as a part of the assignment work in typing may be tested objectively. Most students enjoy doing the assignment work, but, after they have finished a budget, the knowledge they have acquired is often forgotten. When the same learnings are found in a later budget, they must be treated as review and valuable time spent in recall work. An organized program of testing the more important forms after they are taught would help to overcome this difficulty. Students will learn when a test is in prospect. Such a program of testing would make it possible to train typists who would have a mastery of the complete course they had studied rather than a smattering of a few last details. The time to give these tests must be chosen very carefully, and at no time should they be allowed to infringe on the teaching time of another unit. Several methods may be used for these tests. In general, they involve the doing of a copy under specified conditions such as during the class period, sometimes but one attempt or writing, a limited time allowed, the same instructions to everyone and no questions answered, erasing permitted sometimes, etc. This is a test condition, and conditions should be the same as during a test in any other subject. No second chances should be allowed unless that is the rule of the test. Rough draft work should always be done under a test condition. The teacher can set up a scoring plan that may be used on all such tests. Correctness of form should have major emphasis in the scoring, with uncorrectable errors ranking next. If erasing is permitted, then errors that have not been corrected by an erasure should be heavily scored. Time may also be made an element in the scoring.

Each day's assignment or a budget of assignments can be treated as a test upon which to base remedial instruction. An entire class period can profitably be devoted to an output test. Several exercises—more than enough to keep the best in the class busy—must be done in a definite order during the class period (no overtime). Time begins to count as soon as the signal to begin work is given. This type of test takes into account the time used in planning or time wasted between exercises, as well as the time required for the actual typing. Improvement in ability to arrange, in quantity, or in quality of output should be the outcome. If development of some desirable trait, such as initiative, is to be stressed, students may be allowed to arrange an exercise without special instructions. After the problem is completed, a variety of arrangements should be the result. These should be displayed on a bulletin board, and the next class hour should include a discussion of them that should conclude with suggestions for effecting the most attractive arrangement. When emphasis is not entirely on grades, the testing program in typing can become a real pleasure to the students—not an activity to be dreaded. When objectively administered and scored, the grade, if there must be one, will be a fair appraisal.

The New Type Test. The introduction of new type tests in typewriting took place some time ago. They have been used to a limited extent and are still not favorably received by many teachers. To what extent measurement of student progress and achievement has been affected by new type testing cannot be estimated. The use of the new type tests as a measuring stick for the purpose of grading is rather well established, but this is only one of the possible uses of such tests. New type tests have been devised requiring the identification of the parts of the typewriter. Correct finger technique and business customs affecting the typist have been evaluated by means of true false, matching, multiple choice, and completion items. The use of these types of objective tests in typewriting, however, has been negligible and sometimes totally lacking. New type tests are expected to measure *knowledge*, and most of those in use were devised for that purpose.

The true false test is not only useful for testing but may be an effective teaching device. It offers a wide field of information in its use in typewriting. The following statements illustrate the construction of true false questions.

T	F	The paper release is used to assist in removing the paper
T	F	The fingers follow the keys when striking them
T	F	Capital I is used for typing the roman numeral one
T	F	Striking one letter over another is not an error

The statements of a completion test may also cover a wide range of information. They are much like the true false statements, except that they must be true statements. The following examples suggest the type of statement that may be used.

1. The finger is the most difficult to control
2. The most frequently used letter of the alphabet is .
3. There are strokes to an average word

The multiple-choice test differs from the completion test in that the statement given has two or more words or statements from which the student is to choose the correct word or statement to make a true statement. The following statements are given to show how this type of test may apply to typewriting.

1. The carriage is (thrown, drawn, pushed) back at the end of a line
2. Always use (one, two, three) spaces at the end of a sentence

The matching test lends itself to the testing of a number of phases of the work. It should not include more than fifteen or twenty items, as a test with more than that number becomes difficult mechanically. It consists of a list of items and a list of statements. The list of items always consists of a few more items than will be necessary to fill in the blanks before the statements. It is well to give clear directions for these tests and make sure the student understands what he is to do. The matching test idea may be used for testing the beginner on machine parts, as Test 2 of the battery of Junior tests in the author's Commercial Education Survey tests.¹ The following examples show a short matching test based on the business letter.

a. Salutation	1. The .	tells when the letter is written
b. Identification	2. The	tells to whom the letter is written
c. Inside address	3. The	is the courtesy finish of the letter
d. Complimentary close		
e. Date line		

¹ Jane E. Clem, *Commercial Education Survey Tests for Typewriting*, Public School Publishing Company, 1931

The student is to find among the items at the left the one that gives the correct meaning and insert in the blank of the statement at the right the letter that represents that item. Or he may write the answer on a piece of paper should the teacher wish to use the same set of statements again.

The matching test idea may be used as a keyboard test. An illustration of a hand with the correct numbers of the fingers should be included with the test or displayed on the blackboard. The plan of the test is the same as the one above. A list of keyboard letters or characters is given at the left and the statements at the right require the student to tell which finger of which hand writes that character.

The recall test is an information or knowledge test and best serves its purposes with advanced students. It is really a question and answer test, used for the purpose of review. To illustrate this test

1. What is the penalty for rewriting a line in a timed test?
2. How is the exclamation mark made?
3. If a legal document has three pages, what expression should be used in numbering the last page?

Prognostic or Aptitude Tests Vocational guidance has had a long history. In early times men attempted to control their objective environment or to determine their personal qualifications by magic and oracles. Only in recent years has a real, scientific approach been made to the subject. There is no doubt that much time is wasted by students who train in fields in which they do not have the capacity to work to best advantage. If it is possible to guide individuals into the vocation for which they are most talented or keep them out of the vocation for which they have but little talent, a service of inestimable value can be rendered to society.

Prognostic tests have considerable promise in most school subjects but this is hardly true in typing. Teachers and administrators would welcome such tests if they were available and valid. They could be used as a basis for sectioning into homogeneous groups that would be likely to make better progress. They would also find a place in the guidance functions of the school in helping students decide whether or not to pursue a given subject. The construction of prognostic tests is still in its infancy. At present, no single test or battery of tests has yet been devised that will predict a student's success in learning the skill subjects of the business curriculum or in holding an office position.

involving those skills after they are learned. Research effort must continue in its attempts to find predictive measures for business subjects. What has been done has been of some value for guidance purposes, despite the opinions of some doubting Thomases.

From a vigorous start in the 1920's, when psychologists turned their attention from the measurement of general intelligence to the problem of measuring specific aptitudes, some such work has been going on in business education. In 1923, Miss Ann Brewington, University of Chicago, published one of the pioneer articles in this field, which was the result of an extensive study she made.

During the 1930's, little progress was made. The few moderately successful efforts and the many failures to find measures that relate to achievement in the skill subjects very likely have pointed the way to a greater degree of success in the future. In cases where near zero relationships were found and where the studies were adequate enough to be accepted as conclusive, they have eliminated some possibilities that scarcely need to be explored further. They have exposed inadequacies of the criteria commonly used as measures of success: teachers' marks on one or two semesters of the course in which success was being predicted, theory tests in shorthand, usually subjective and without known reliability, and speed tests in typing. That these are not adequate measures of success has become quite clear to research workers, but true criteria of success are yet to be found or at least agreed upon.

Most of the predictive studies in business education have been made for graduate degree requirements, in which time and financial limitations prevent a study of adequate length. The need is for more extended researches that gather the predictive measures before the skill subjects are studied and carry the students through the completion of their business courses and on into employment. Perhaps the greatest weakness of most of the studies in this field is that the measures of success have been taken after too short a period of study—sometimes less than a semester and rarely longer than one full year. Another weakness is that the predictive measures have often been applied after the students began the study of the course—sometimes even concurrently with the measure of success. Through the work of both experimental psychologists and educators, the realization has come that the problem is far more complicated than at first it appeared. Evidence is that both groups will continue working on special aptitudes, though the prediction of success in learning the stenographic skills seems to

be almost entirely in the hands of business educators. The possibilities of success criteria have by no means been exhausted. Determining and using these are the next steps in the work, for how can prediction take place if success is not recognized?

In an article in the *Business Education World*, Mathilde Hardaway says

The predictive measures that we now have available can be judged only in the light of the success measures that have been used to validate them. No two tests in the field have been validated against the same criterion, and consequently their validities cannot be compared. So far as the criteria used on these instruments are of value, the tests yield as high predictions as are generally found for comparable measures used in other fields of study. Even "general intelligence" tests, which are now widely accepted for guidance purposes, show no better record.¹

I Q's have been shown to have little relation to typing success when judged by speed tests and manipulative processes, but the relationship becomes significant when the measure of achievement involves ability to arrange and produce usable work.

Aptitude tests cannot be judged by appearance. Users of such tests should have some knowledge of the nature of special aptitudes and the elusiveness of their measurement. Tasks that look similar may not require the same ability and may not even be closely related in the requisite ability to perform them. So it is impossible to tell from examining the contents of an aptitude test what it measures with any thing like the same precision that can be done by examining an achievement test. Surprising and disconcerting results have come to some who have constructed aptitude tests.

Combinations of several factors hold the most promising possibilities for a sound basis for not only guidance but for prognostic or aptitude testing. A combination of factors peculiarly suited to each school situation or subject should be worked out, tentatively at first, with at least one group of students carried through to the completion of their business course before it can be used with confidence. The I Q should be taken into consideration, at least in a general way. The simplest group of factors that can be recommended would be foreign language grades, if available, and previous grades in English, especially grammar and

¹ Mathilde Hardaway, "Prognostic Tests for Skill Subjects," *Business Education World*, March, 1945

composition, coupled with the best available prognostic test. The most successful program yet reported was that worked out by Dr. Elvin S. Eyster, when at Fort Wayne, Indiana. The data show that predictions were made on 617 students. Of those who were predicted to be successes, only 2.4 per cent failed, and from those predicted to be failures, none passed. Of the group that was given an even chance, 49.2 per cent failed. The factors used in the predictions were mental rating, average English grades in high school, average of other grades, score on the Hoke Prognostic Test, and personal trait ratings made by teachers.

Several clerical and mechanical aptitude tests are used in business and industry. None of these have been found very satisfactory in predicting success in learning typing, but some are used widely in selecting applicants for office jobs. In the *Business Education World* for April and May, 1945, Mathilde Hardaway gives a fine evaluation of these tests.

From the number of experiments made by psychologists on learning to operate a typewriter, it would seem that the psychology of learning typing has been studied scientifically enough so that prognostic and proficiency tests would have been constructed and applied long ago; yet this has not been done. In fact, there is only one test, Thurstone's "Proficiency Test for Typists," suitable for use in the classroom. Some mental tests for typists are available for use in the classroom, but many teachers do not appreciate the service that such tests render.

Diagnostic Testing in Typewriting. The purpose of diagnosis in typing is the same as in medicine—to discover what is wrong and to prescribe the proper remedy. It is inconceivable that intelligent remedial measures can be taken in teaching or in medicine without some adequate diagnosis. Diagnosis must be specific and not general. The doctor determines that a specific thing or process is at fault and then applies a specific remedy; likewise the teacher of typing must do the same. Diagnosis must also be comprehensive. A certain disease may be the result of several complications. In the teaching of typing unfortunately, but one small phase—the accuracy of the typed result—has been the basis of diagnosis. Any failure of a typist to attain his best speed, accuracy, or fluency in the realm of skill constitutes a focal point for diagnosis and remedial work. If typing teachers would attain the standard of professional excellence that the world expects of physicians, they must diagnose the whole situation surrounding each indi-

vidual and his ability. This includes mental as well as manual considerations.

For many years there was only one widely used basis of diagnosis and remedial work in typing. It was the "perfect-copy" standard. Its application contributed no information to the student as to why he made errors in the typed result. The teacher did not usually attempt to diagnose why the perfect copy was not produced. No intelligent improvement practice could be based on such a situation. Its only merit was that it was easy to assign, to administer, and to grade. This was followed by the so-called "error chart," which provided information that the student made errors, but gave no clue to the real causes of these errors.

From the standpoint of the learner, probably the most important testing, and that which is most productive of results, is diagnostic testing, which is done for the purpose of finding a basis for remedial teaching. Difficulties are brought to the student's attention by tests and remedies offered to overcome them. A diagnostic testing program for typing, upon which remedial teaching may be based, should consist of many types of tests, given frequently and preferably as short tests.

If a class is composed of students who have had typing before, especially under varied conditions, an inventory test given before any new unit is presented is very desirable. The results of such a test show the weak points of the class as well as of individual students, and it offers a splendid opportunity to make the classwork more interesting by omitting the rehashing of material that is already known by most students. These tests also serve as an incentive to each student to "mend his own fences." Before much drill has been given to establish typing habits, errors in fingering should be detected to avoid the wasting of the student's time and effort. A tracing around each hand as it is spread on a piece of paper gives each student an outline in which the letters controlled by each finger can be written as he gets the responses by fingering the keyboard of his typewriter. Such tests are easily and quickly checked by the teacher at the student's desk and enables remedial teaching to be done at once when it will be most effective. Short tests can be frequently given by dictating questions to be answered by the writing of a word, number, or short phrase. If each student checks his own test as the teacher reads the answers, an opportunity is given for correcting faulty concepts. A series of these tests, consisting of perhaps ten or twelve questions each, may be started very

early in the beginning course. The early tests might contain such questions as, "How many spaces should be used after a semicolon?" Later a question like, "What should be included in the heading of the second page of a two-page letter?" And still later, "What is the standard line length for manuscripts?" Tests on parts of the machine to be answered by inserting numbers found on a diagram of a typewriter can be adapted to this method of procedure. There are no devices for the direct measurement of posture. It is conceivable that a score card could be devised assigning points on the basis of an ideal posture. The habit of posture is not to be found in statements of how to sit at the typewriter, but it is in human beings. Therefore, the several attempts to set up a measuring stick for correct posture may serve to diagnose a student's position but will not make it habitually correct.

There is not just *one* method of diagnostic testing. There are too many elements to diagnose in the learning process of typing skill. The recognized principles of test construction applicable to the type of test one is constructing and the purpose to be served must be followed if his endeavors are to be successful. The complexity of the procedure is no index of the value of the test or its results.

Published and Standardized Tests for Typewriting While a considerable number of tests have been published for typewriting, none have gained a great deal of popularity. Some of the tests contain a large number of objective type items that measure knowledge about machine parts, their manipulation, proper spacing, and the use of special symbols. Some of them test punctuation, spelling, and proofreading. It is a matter of opinion just how far such tests are of value. The course objectives must decide that. Certain it is that tests on how to type are more valuable during the early period of instruction than in advanced work. They can never substitute for measures of actual performance. Various tests have been published recently that are designed to measure the ability of the typist to produce a reasonable quantity of usable work at a sustained rate over a considerable length of time. These may be used very effectively to determine whether the student can achieve production standards rather than learning standards. All testing in the advanced course should be of the performance type and a large part of it should be production work under time. Many teachers believe that even knowledge of "how to do" can be tested better by problems in which the student demonstrates his knowledge by applying it.

Although standardized tests are distinctly superior in certain respects

to ordinary tests, speed tests, or teacher-constructed tests, they cannot be thought of as perfect measuring instruments. Some approach perfection more nearly than others, but even the best are subject to limitations that must not be overlooked. The measures yielded by standardized tests are in general more reliable than similar ones secured by ordinary tests or by the teacher's estimates. Standardized tests are valuable tools that teachers and supervisors may use in making their work more effective. But unfortunately the teacher of typewriting has very few standardized tests to use.

Space does not permit the review of all interesting and useful tests in typewriting. If information is desired, a complete description and evaluation of most of the tests available will be found in the October and November, 1944, issues of the *Business Education World*, in an article by Mathilde Hardaway.

The Problem of Testing In many schools students, on entering, are carefully measured with respect to their mental ability and are classified accordingly. While the teacher of typewriting may know that within a very limited range the students in his class are of the same mentality, yet their characteristics are different, so their possibilities for motor skill are variable. When there is a wide range of mentality, the teacher's problem is further complicated. It is therefore the hope of business educators that tests may be constructed that will quite reliably determine the aptitude of the student for learning to typewrite. With reliable aptitude tests, it will be possible to select those students best fitted for vocational typewriting, those capable of average skill, those for whom only a very limited personal use is possible, and those with so little aptitude for it that it would be educational waste to permit them to take it. There is much to be gained by grouping students into classes on the basis of their ability or aptitude, but such grouping should be the result of scientific measurement rather than subjective judgment.

Devising tests that are fair measures of achievement is difficult. The type of performance test that is usually given at the end of each grading period serves to rank a class according to ability but does not serve as a measure of the student's typing competency. When the class average is high, the individual student's score is lowered. Should the test come on an "off day" for the student, his score is heavily affected. Although performance tests have a place in typewriting, just as in any class, they should be considered in grading for exactly what they are

—a means of ranking the class from the highest to the lowest on that particular day. They should not be given undue weight as a measure of a student's vocational typing ability. To measure vocational competency adequately, tests covering each productive application should supplement the ordinary achievement test. By the use of a series of similar tests, a student is given several opportunities to demonstrate that he has developed adequate ability to do a specific typing job. Also, he is given more than one chance to improve on weaknesses revealed in the preceding test. Thus, tests can motivate, diagnose, and teach as well as measure achievement.

The problem of testing in typing needs more experimentation and research. The present trends are listed in *Tests and Measurements in Business Education* and show that progress has been made. These trends are:

1. Less emphasis on short, copying speed tests after techniques are well developed.
2. More emphasis on the typing jobs common to most offices.
3. Longer practice and testing periods as often as is possible, to approximate more nearly office working conditions.
4. More practice in noting and correcting errors. Penalties for both correctible and uncorrectible errors.
5. Regular rejection of items containing uncorrectible errors.
6. More attention to synchronizing all motions involved in doing a composite typing job as contrasted with straight copying.¹

CLASS DISCUSSION QUESTIONS

1. How does the purpose of testing in typing compare with the purpose of testing in other subjects?
2. What outcomes of typewriting learning are reasonably adaptable to measurement of techniques? What outcomes are not adaptable?
3. How important is the teacher's bearing when starting a class on an important timed test? May it affect the results of the test?
4. What different kinds of tests should be provided for the measurement of different typewriting abilities?
5. How may testing in typing be used to measure, and how may it be used to teach? How may testing be an aid to instruction?
6. Discuss and evaluate the twelve purposes of testing in typing as given in this chapter.

¹ Benjamin R. Haynes, M. E. Broom, and Mathilde Hardaway, *Tests and Measurements in Business Education*, South-Western Publishing Co., 1940.

- 7 May speed tests be considered the ultimate measure of achievement in typing? Why or why not?
- 8 Differentiate between learning standards and performance standards for testing in typewriting. What is a production standard, and how is it related to the two above?
- 9 Do the same principles apply for interpreting test results in typewriting as for other tests?
- 10 Are variations on test performances to be expected in typewriting? What are some of the causes?
- 11 Can variation in test performance be reduced? If so, how? How can consistent achievement be promoted?
- 12 Why are timed tests given? How useful are they in measuring the ability of a typist? Discuss their advantages and disadvantages.
- 13 What is an objective test? Can the different phases of typewriting work be measured objectively?
- 14 Supply an additional item for each new type test described in the chapter.
- 15 Why is the class average, or median, an imperfect method of determining the real ability of the class as a whole?
- 16 Does testing help a teacher to determine the weak points in his method of instruction? If so, how?
- 17 To what extent are the error charts that have been used diagnostic tests? Diagnostic testing may be the most productive of results if it is followed by what?
- 18 How considerate should a teacher be of cases of nerves in timed writing work in typewriting?

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CHAPTER XIV

Grading—the Measurement of Achievement

The Importance of Grading. The successful operation of a school demands an accounting of the work of its students. Marks or grades have been the universal measure used to determine the fruitfulness or wastefulness of the methods of learning and teaching all school subjects. It is necessary to evaluate the achievement of students as accurately as possible because so many problems in the management of a school hinge upon the assignment of student grades.

By tradition, school systems require each teacher of a class or subject to report to the administrative officers a single standing for each student in his classes. At the end of each grade period, the teacher is supposed to evaluate for the administrative officers, parents, prospective employers, or others the degree of efficiency with which the student is progressing in the subject. One single mark is supposed to give all this information—general intelligence, general ability, personal appearance, readiness of speech, manner, attitude, memory, personality, understanding, application, punctuality, neatness, industry, speed, accuracy, technique, written work, and daily attendance. Mathematical laws state that unlikes cannot be added and averaged, yet teachers must take a long list of these unlike elements and average them with perfect equanimity into a single symbol called a grade.

The assignment of grades to students is a matter of great importance. Grades constitute a very real and strong inducement to work, they are often determiners of the student's career, they constitute the primary

basis for advancement from class to class, for election to honorary societies, for the award of academic honors, for graduation from high school, and they now decide his admission to college or employment in the business field. If grades were simply means of giving some students prominence above others, the question would be immaterial, but the grade has in more than one sense a cash value. A lack of uniformity of grading among teachers of each subject means that values are taken from some and undeservedly presented to others. The variability in the marks given for the same subject and to the same students by different teachers is so great as frequently to work real injustice upon the student. Whatever contributes to a greater uniformity of grading contributes directly toward a better mutual understanding and a greater community of purpose among all teachers.

Teachers tell students not to work for marks, but, so long as marks determine progress and assume to measure growth, students will and should be intensely interested in them. Yet most schools are guilty of using every possible device to stimulate interest in high marks. Honor rolls based on grade points are given publicity. Valedictorians and salutatorians are selected on the basis of marks. Medals and scholarships to colleges are granted to those receiving the best marks. Marks determine credit or failure, promotion or retardation, graduation or elimination. In fact, the entire scholastic machinery of any school operates on the basis of marks. With so much attention given to marks, it behooves principals and teachers to be seriously concerned that marks be awarded only for the attainment of worth while objectives.

The Purpose of Marks. Marks or grades have been used for so many years in school and college instruction that the significance that should properly be attached to them is often overlooked. The mark should show the student his standing in comparison with those of his fellow students, his knowledge of the subject matter, and the quality of his work. The student is interested in knowing if he is progressing in his work, falling behind, or maintaining a constant level. The only real check he has upon the results of his efforts is provided by the estimates placed on these results by his instructors. Teachers use marks to motivate students to do their best and to evaluate the efficiency of their own work. Parents rely on marks to estimate the success of their children in the usual school activities. Whether or not present marking systems accomplish these purposes is a question.

Grades are usually incorporated in the report cards sent to parents and in the records of these reports kept in the principals office. Most teachers do not assemble and compute marks except as they are required for the report card. It is intended that these report cards supply the parent with a basis for co-operation with the school in the interest of the student. To the teacher, the marks are supposed to indicate how well or how poorly he understands the individual and collective needs of his class. To the school, the marks are expected to give reliable and interpretable records that make possible a proper placement of the student. To the prospective employer, the marks should furnish reliable information as to the student's fitness for a specific position in so far as scholastic proficiency is concerned.

The attitude of the student toward the mark he receives for his work deserves serious consideration. Since marks are so important, it is natural that students will covet high marks. The intelligent student concludes that it is just as profitable, so far as his marks are concerned, to study the teacher as it is to study the subject. So students are encouraged to curry favor with the teacher, to "apple polish" to be dishonest, or bluff—in short, to work only for grades, and not for what he should learn. A system of marking should be devised that satisfies each student as to its impartiality, objectivity, and fairness. Students are not convinced that the marks given them are fair by merely telling them so. The teacher needs a visible scale so that the student may see himself "weighed in." The problem, then, is to make the basis of all marks impersonal by making them objective.

The Basis for the Mark, or Grade Since marks are used chiefly as the basis of reports on the student's work, they are valueless unless everyone concerned understands what basis was used in their determination. Marks attempt to compare the student's work with some standard. Unfortunately, this standard is too often elastic and elusive. It varies with the moods, whims, likes, and dislikes of the teacher. For years businessmen have had very little confidence in school marks largely because they know that marks represent a mixture of considerations and it is impossible to tell which consideration is dominant. It would seem that the only scientific basis for marks in typing is a double record of absolute achievement and relative improvement separately stated. During the grade period the improvement that is made is the important thing and the poorest and best have equal credit for what they accomplish. At the same time it is a gross injustice to the com-

munity to send out graduates with high marks when they have not attained the degree of mastery that entitles them to such marks. Hence, the need in typing is for two separately stated grades, one indicating absolute achievement and the other indicating relative improvement. If but one grade can be entered on the report card or on the office record, then the best grade is an average of the two grades. If they are averaged, different weights can be given to the two grades, for example, a weight of 2 for the achievement and 1 for the improvement grade. If it is thought better to use only one, then the achievement grade should be the choice.

Since it seems necessary to have grades, they ought to be such that they can be used intelligently, and the only way they can be made to serve intelligent use is to reach a measurable agreement as to what they are meant to indicate. A grade in typing, for instance, should represent achievement. When the student is graded on the basis of achievement only, he is being graded on the *quality* of his work. When the teacher grades on the *quantity* of work submitted by the student, he is grading *production*. When he penalizes the grade for inattention, he is grading *attitude*. When he deducts from the achievement mark because the work was handed in late, he is grading *punctuality*. If it is desirable to consider other elements, like the student's effort, this trait should be so separate and distinct in its definition as not to be confused by any chance with the actual achievement grade. Should it seem expedient to pass on character, personality, or fitness for a job, the marks should be distinctly defined and kept separate from all other marks.

Teachers may be confused by the elements they hear discussed for making up the grade of the typing student. The terms most frequently mentioned are ability, performance, technique, accomplishment, attitude, improvement, achievement, responsibility, and skill. It may help to define and compare some of these.

Ability describes how gifted a student is in learning a skill like typing. Accomplishment is largely determined by ability, but the teacher must recognize the type of student whose ability is not reflected in his accomplishment for lack of earnest application. Most teachers feel that grades should indicate accomplishment, and not ability alone. Performance is determined by neither ability nor accomplishment, and is a difficult factor to grade. The student who does a piece of work without error, using poor technique, is working for a grade and not

for skill improvement Teachers must teach many things that cannot be graded—in fact, need not be graded—such as co operation, responsibility, honesty, and the right attitude toward his work, his teacher, and his fellow students Sometimes these characteristics are reflected in the grade, but their use in that way should be limited and carry no thought of penalty They may, however, be used as a basis for recommendation when the time comes for a job Students bring attitudes of every sort into the classroom and will change them as circumstances and mood dictate Dr Marion M Lamb sets up a criterion in her book by which attitudes may be evaluated¹ Some schools follow the practice of having teachers grade a student on subject matter work, then rate him according to a check list of personality and character attributes This is a rating procedure for administrative purposes only with the school assuming no responsibility for the development of right characteristics The plan cannot be compared in value to the practice of having teachers handle the problem as part of the classwork provided they do it in the right way The teacher must be able to recognize these personal characteristics and study the student's needs in this respect, while the student must know his shortcomings and be willing to correct them

Some Problems in Grading Grading is more difficult and complicated for advanced than for elementary typing While the student is learning the keyboard and developing ability to do straight copying there is little upon which to base a grade The thought of grades may increase his effort, but it will also encourage poor technique at the time when he should be developing the best habits of operation of which he is capable This grade tension may be prevented by telling students that there will be no grading of the few papers handed in during this period The requirement that is best from the standpoint of technique emphasis and that will provide the fairest basis for the grade is to require him to do his best A teacher cannot ask or expect more The student is to be the first judge as to when he has done his best and the teacher is to be the final judge This will make him work for a mark, but in a desirable way, for he will know that every degree of improvement will add to the accomplishment on which his mark is based

When students are asked to hand in the best copy written during

¹ Marion M Lamb *Your First Year of Teaching Typewriting* South Western Publishing Company 1947 pages 110-111

the practice time devoted to the exercise, students will proofread their work better and the grading will be simplified for the teacher. Unless too long a time is allowed, the variations of the normal frequency curve will be found time after time, and each student will slip into his place in the group without calling on the teacher to pass judgment on him. He is graded on the actual work he has done, which may be called "his achievement." Each day his achievement will be more or less than the previous day, depending on the difficulty of the exercise, his physical fitness for his work that day, or the way he applied himself. Thus, many things will affect his mark each day—but the student determines these elements, not the teacher—therefore, it is fair because it is impersonal and objective. Wherever it seems necessary to raise the quality of work, a limit may be placed on the number of errors a piece of work contains. This limit of errors should never be a fixed figure for all work but should fluctuate according to the length and difficulty of the exercise.

The achievement of the student on each piece of work will be averaged to determine his mark for the grade period, and a comparison of that mark with the mark for the previous grade period will show his improvement as he progresses in the course. When the teacher marks achievement, he should be concerned only with what the student can really do. When he marks improvement, he is concerned with rewarding those who have made much improvement but who still may rank low in real achievement. This means that he wants to encourage some students by complimenting their industry. Thus, a student's improvement may be reflected in his achievement.

Grades in advanced typing should be based on a weighting of the excellence with which all course requirements are met. This means that grades should be based on the student's speed and accuracy on straight copy, on his improvement from the beginning of the course, on his dependability in fulfilling assignments and following directions, and most of all on his ability to do vocational typing—to prepare for a job. Speed test grades may be unfair in the advanced class unless a means for grading improvement is found. A student who could type 70 words per minute when the course began and at the end has increased his speed only one or two words per minute should not be given an A in the course. It is difficult to grade improvement in speed because it is harder to improve at high levels of speed than at lower levels.

In grading, as in setting up standards, too much emphasis has been placed on straight copy work and too little stress on proficiency in other typing skills. The use of textbook exercises and tests at the end of each grading period as the basis for grades on proficiency in production jobs is responsible for much of the lack of emphasis placed on vocational typing. Counting work on textbook exercises as production work and grading it as such is undesirable when students are allowed to work on assignments outside of class, because grades on this work are more nearly a measure of such character traits as perseverance, carefulness, honesty, or neatness than of productive ability. Without timing and observation, no one can tell how many attempts were made on each exercise before the final copy was completed.

Knowledge essential to intelligent performance of the typist's job is reflected in job performance, and grades on such work should be based on daily observation of the student at work and on his daily work as well as his test scores. Most students need some training and practice in error checking so that they can check their work on the job later. There is a significant relationship between the school situation and the office situation in that in school it is not to the student's immediate personal advantage to report errors if his papers are not checked elsewhere. In the business office, however, it is to his advantage to find and correct his errors, and he knows it.

The Marking Code. There are numerous ways of translating standings into a scale of symbols or marks. The best possible division of marking is to divide classes into five groups. Considering ability and achievement, it is psychologically true that mediocrity is the commonest condition, therefore, the largest group is the average student. Above and below this average group lie groups of smaller size containing superior and inferior students. Everyone is familiar with the symbols generally used to represent these five groups—A, B, C, D, E (or F). This five division plan is not only the easiest method, but it is also the fairest, because it makes no pretense to an impossible standard of requirement and makes a no more refined classification than known limits of human judgment justify. The human mind does not readily grasp a more elaborate classification than five groups.

Most investigators are in accord with the view that percentage grades, which were used for years, are of little significance, although they may not agree on the distribution of grades for the five groups. Even though that distribution fluctuates, it is a fairer means of marking

than the percentage method. Personal feelings of the teacher are likely to play too prominent a part in the effort to make the fine classification of the percentage method. In the business field there is an even more serious objection—the passing mark, which is usually 75 per cent, is too low. A student who goes through a business course averaging between 75 and 80 can never cope with the demands of the exacting business office, and is likely to become a failure in his job. With the use of the normal distribution or frequency rating method, it is possible to maintain a higher standard of attainment for the passing mark, D. Since both methods are still used, it will be necessary in this chapter to treat both symbol and percentage methods in the suggestions for grading typing work.

The Need for Standards. Business requires much of its workers. For years business took the product of schools and molded them to fit their needs. This required several months sometimes, but business seemed to expect to do this, because it believed something was necessary to bridge the gap between the training course and actual experience. This naïve attitude prevailed in business for years, and then businessmen began to question the efficiency of their office workers. Typing teachers saw a challenge in this criticism and have tried to justify the standards they have been using as well as evaluate them in terms of business needs. Perhaps this has been a factor in bringing about the trend in production training in the teaching of typewriting.

The success or failure of a teacher is largely measured by the degree to which his students succeed or fail. Setting aside the differences in personal characteristics of teachers and their ability to train students in habits of honesty, courtesy, punctuality, neatness of work, and personal appearance, the success or failure of students in typing may be attributed to the differences in the standards of measurement of student attainment used by teachers. If a teacher, through a desire to promote his students, uses a low standard of measurement, those students will be forced to remain in underpaid positions or fail entirely.

While there is no doubt that the schools have not been so efficient as they should be, business also has failed. It thoughtlessly accepted as job standards those developed by the schools as learning devices and has particularly failed in giving on the job training instruction. Business should accept the responsibility for determining the job standards. Then, in co-operation with the school, business should provide for carrying over school learning into the office. Office managers and steno-

graphic supervisors must be less ready to condemn the work of the schools and more willing to help the beginning worker in his adjustment to his office job.

What Are Actual Job Standards? Standards are goals, objectives. In their desire to set up objective standards, business teachers have set up standards demanding a given number of words per minute in short hand dictation, typewriting, and transcription. For graduation from a secretarial course in high school, standards are usually considered very important.

Teachers spend much time discussing their standards. Business firms have also set up their personal tests in terms of their standards. Personnel officers assume these standards to be sound, since teachers use them. On the other hand, teachers go to businessmen and stenographic supervisors and ask them what their standards are as a basis for validating their objectives. Thus, business copies the standards of the school and the school those of business, and neither makes the effort to determine what is really needed on the job by actual job breakdowns of what stenographers do when actually at work.

Standards in typing classes are usually thought of in terms of the number of five letter words a student can copy in a minute. Survey studies show that classroom and business standards tend to be somewhat arbitrary. As yet no one has established conclusively just what a good typing production rate is, whether 75 words per minute on straight copy, 40 words per minute on business letters, 30 words per minute on reports, 25 words per minute when composing at the typewriter, or 20 words per minute when typing statistical tabulation. Typing teachers ask business offices what speeds they require for initial typists. Naturally, the answer is a high figure, because they realize that the higher the formal standard the easier the initial learning adjustment will be. Businessmen usually measure output in terms of the number of mailable letters produced a day. They do not concern themselves with the number of net words typed a minute. For the most part the stenographer's supervisor does not know what standards he expects her to meet. He wants a reasonable number of mailable letters a day, courtesy over the phone, ability to find letters in the files, willingness to "kill" time unostentatiously when there is little work to do, and an added assortment of similar qualities and quantities of service. He thinks he knows whether his secretary is producing enough.

It is true that, in some offices where there are a considerable number of workers and where the jobs have been routinized, general guide standards can be followed. For example, a typist in an hour should be able to type three to five nontechnical stencils free from error or completely corrected, 100 three item cards or envelopes, ten average length letters, or 100 fill ins. Attainment of such standards assumes that working conditions are good and interruptions are rare. When the stenographer serves as receptionist, general clerk, and telephone girl, in addition to regular stenographic duties, all formal standards cease to operate. In fact, formal attempt at standardizing most office operations is quite futile. Quality of work and general attitude are the only meaningful factors in evaluating stenographic service. Only to the extent to which formal school and employment standards help the beginning stenographer attain such practical job requirements are they of any significance. Thus school standards are only an approximation of what is required on the job.

Increased competition is forcing businessmen to devise ways of obtaining greater production efficiency. While many business offices have no satisfactory standards, an increasing number of office managers are adopting standards of output that they expect office workers to meet. The production techniques of industry are finding their way into the office. Job analyses and motion studies are being made, efficiency devices tested, and records kept of individual production. There is one best method by which maximum production can be attained, and business is seeking and finding it. The typing teacher must keep abreast of these changes. A wide gap exists between school and business standards. Schools have been content to think in scholastic terms only, school credits and a diploma being all important. The graduation diploma is utterly inadequate as a standard of vocational competency.

School standards in typing have too often been interpreted solely in terms of words per minute, with a specified number of errors allowable, but business wants a worker who can produce mailable letters. For some time there has not been agreement as to what constitutes a mailable letter. That must be determined through a specific occupational survey and job analysis of the current practices in local business offices. Where concrete standards of achievement are lacking, the typing teacher should enlist the help of local businessmen in devising satisfactory minimal requirements for entrance into office work. In the

larger centers the standards indicated by the better types of employment agencies are reasonably good measures for determining the value of a vocational course. Many such agencies cater to a select business clientele, and their standards therefore represent the requirements of the most desirable positions in the area. Employability itself is not necessarily a desirable criterion, because employment conditions change from time to time and employers are often forced to accept many workers whose skills are far below desirable standards. It is not so much the job, as success in it, that counts.

The high school should not aim to train students to meet the standards demanded of experienced workers. It should prepare typists to meet the initial job standard required by business for beginning workers. At the beginning of each course in typing, a standard of achievement should be established that harmonizes with local business needs. Advisory committees of businessmen, perhaps through the chamber of commerce, can be requested to work with the secretarial teachers in determining what the standard of efficiency should be. These basic requirements can be used as selective factors in admitting students to the various classes in the business department. If the standards are set in co-operation with businessmen, the school is relieved of a certain pressure. The contact with office managers also provides the teacher with an excellent opportunity to arrange for co-operative work for the students. It is the belief of many that students must be given work to do under actual employment conditions if their vocational training is to be completely successful. This plan is used successfully where businessmen are willing to co-operate.

The diploma should be given as evidence of graduation from high school, but it should cease to be used as a criterion of vocational success. It should be replaced by a compact certificate of proficiency small enough to be easily carried, giving the work done by the student in the business department, his general and specific competency, and any other facts that the employer should know. The offering of proficiency certificates for attainment can be used to energize interest, to improve efficiency, and to promote mastery. These certificates should not be given when the requirement is met on just one test or even on a test that is not comprehensive enough to measure reliably the examinee's ability. Neither should they be given at the end of each grade period or semester. They should be an award for the successful completion of the entire vocational course and become the student's

recommendation for a job. Therefore, the holder of a certificate of proficiency must demonstrate that he is qualified in all respects to receive the honor. This means that the student must substantiate his ability to meet the required standards of business as well as of the school. Students who complete all the assignments in the typing course but who fail to reach some of the other standards may be given credit for the course, if the teacher chooses; but they should not be certified as typists except with clear explanations of their limitations and lack of qualifications. Typing skill functions at various ability levels; and, although there is need for typists at low-ability levels as well as high-ability levels, there is danger that graduates will be placed at the wrong level of work unless training records are accurate and complete. It is unfair to the student, and a reflection on the teacher, when the student takes a job above his ability level.

The Problem of Setting Standards. One of the most difficult problems in teaching typing is that of setting achievement standards. The speed standard on straight copy too often overshadows many other equally important phases of typing skill. Most schools have a definite requirement for speed and accuracy on timed writings. On the high school level, the state course of study generally sets such a standard, while in colleges the standard is usually set in the school catalogue. These sources state specific standards for speed and follow the statement with generalized remarks about productive skills; so the only standard that is definite is the speed standard. The speed set tends to become the minimum requirement for the course, and other abilities are assumed to be developed if the student does the daily work assigned and compares favorably with his classmates in other things. The practice of making standards look good in school publications gives rise to another difficulty. Ideal standards are given in their published materials, and beyond this standards mean nothing.

A standard is most useful when it is set as a guide for the average student. Standards are usually minimum and so are really unsatisfactory as student goals, although they are helpful to the teacher. The development of vocational proficiency is the main objective of any advanced typing course; so its standards should include specific achievement rates for every phase of typing that is taught. Failure to set standards on production is not surprising because of the difficulties that arise in determining what should be considered satisfactory performance in such skills as letter setup, tabulation, etc. It is

almost impossible to find an authoritative source giving such standards. It would be most desirable in the training of stenographers if universal standards could be set up, but there are many barriers in the way. Since typing is so largely a practice subject, the time element is most important in the progress of the student. The amount of time devoted to typing instruction varies too much for standardization. Although the training work for World War II proved the possibility of the shorter training time, yet most schools spend too much time. The great difference in typing textbooks also makes standardization of instruction impossible. Even teachers vary in their ability to instruct so much that uniform standards are affected thereby.

But even with these handicaps it is possible to set up some goals of attainment for definite periods of time. These attainment goals are minimum standards or requirements and make no attempt at measurement. If the student fails to reach the standard of attainment, it may be the teacher's fault as well as the student's. Therefore, a standard should be set up as a goal of attainment for student and teacher.

Standards of Achievement. As each semester draws to a close, a successful teacher, like a successful businessman, will take an inventory of what has been accomplished. He should want to know of what ultimate value his work has been and what his students have achieved. In his mind have been certain things he has hoped to achieve. What might these be?

Each student of typing should have formed as many useful habits as his advancement in the course will permit and should be prepared to form other habits that will control his work after the course is completed. Such habits control the skill of operating technique and the ability to use and make practical application of that skill. Habits of equal importance for success in life should also be formed—neatness of work and of personal appearance, attention to details, respect for authority, economy of time, use of materials, etc. The most successful teachers are those who make these lessons a part of the day's work.

The student should be able to take a given problem and carry it through to successful accomplishment, the difficulty of the problem to depend on the advancement of the student. This should show the student's ability to arrange typewritten material correctly and attractively, as well as the extent to which initiative, self reliance, and resourcefulness have been developed.

Students in typing should develop a co-operative attitude in promot-

ing the general welfare of the class. Such an attitude would aid in establishing desirable work habits, in promoting careful use and care of the equipment, and in sharing the responsibility for classroom management. The student should assume a responsible attitude toward his work. This would be shown by the promptness with which he starts his day's work, by the steadiness by which he works at his assigned task, by his adherence to high standards of performance, by his study of his errors and his endeavor to eliminate them, and by the continued improvement he makes.

The work of the first year should give the beginning student a sure foundation for growth in speed during his advanced course, and the training in speed should give the advanced student a keen desire for skill in operation, so that the possible 60 words per minute reached by him will be only a beginning of what he will try to accomplish after his typing course has been completed.

Standards of achievement are not just speed goals nor accuracy attainments, neither do they specify how many budgets or assignments are to be done during the semester. They are learnings to be achieved, skills to be developed, and habits and attitudes of conduct to be promoted. It is, therefore, difficult to be specific, to set up these attainments in concrete form, but as definite standards may prove helpful to some teachers, they are here discussed. In using them remember they are flexible, so teachers may use them to fashion their own.

First Semester During the first semester in typing, students should accomplish at least these things: acquire a knowledge of the mechanism of the typewriter in general, correct fundamental habits of operation, establish a good writing position at the machine, memorize the keyboard, and be able to operate the machine continuously with reasonable accuracy and a good stroking technique. Speed requirements should not be used nor errors penalized. Swift stroking should be habitualized, and not slow, cautious writing to avoid errors. Controlled writing should be encouraged, to insure accuracy later.

Second Semester (Vocational Typewriting) During the second semester, the student should attain the ability to write correctly and arrange attractively any length or kind of business letter. He should be prepared for transcription work after this semester. He should be able to address envelopes rapidly yet correctly. He should be able to type simple tabulation well. He should learn to type the simple manuscript forms. He should attain controlled writing so that he can write easily.

from new matter with a high degree of accuracy. As a test of his attainment in speed, he should be able to write on new matter for 10 minute periods at the minimum rate of 30 net words per minute, if he claims to be average, he should be able to write between 35 and 45 net words per minute, and if he is superior, he should type at 50 or more net words per minute. An error limit that is neither too lenient nor too rigid may be used.

Since elementary or first year typing is usually recognized as a general subject and for the vocational student must be followed by another year of typing, promotion requirements become important. The student's capacity to accomplish, his promise of success in meeting the standards of the third and fourth semesters, should be the basis for his promotion requirements at the end of his second semester. An accomplishment prerequisite may be set up as a requirement for enrollment in third semester typing to provide a means of selecting those capable of developing into acceptable office workers. It is suggested that this prerequisite be either based on grades (only A, B, and C students) or on the ability to type consistently from straight matter at the minimum rate named above with no more than an error per minute of writing, the possession of a reasonable mastery of the knowledge and skills required for two semesters of typing, and the promise of the development of those personality traits essential for a successful office worker.

Second Semester (Personal Use Typewriting) Unless the personal use course is limited to one semester, the second semester should concentrate on the mastery of those forms that the student will need to use in doing typing work for himself. The forms he will need most are those of manuscript work. He should study the most used business letters and learn to do well at least one form probably the semiblock. He should be taught to make carbon copies, address envelopes and do simple tabulation. He should strive to attain such controlled writing that he can write quite easily from new matter with some degree of accuracy. He should be taught how to improve his accuracy and increase his speed should his use of the skill of typing demand it after his course is completed. His attainment in speed should be at least 25 words per minute net as a minimum else his skill would be no better than the rate of handwriting. An error limit need not be applied. The increased amount of knowledge and skills that the personal use student should learn allows him less time for speed development than

the vocational student, and it should be remembered he may not have the gift for typing that is expected of the vocational student.

Third Semester. During the third semester the student should learn to solve practical problems in arrangement, to type corrected copies of rough or handwritten drafts correctly and quickly, and to type accurately and arrange attractively the more difficult manuscript forms. Any special business-letter forms not taught in the second semester may be taught, as well as the making of more than one carbon copy. His ability in controlled writing should be extended to more difficult copy and for longer periods of time. In speed, he should be able to write on new matter for 10- and 15-minute periods at the minimum rate of 40 net words per minute. If he is an average student, he should write between 45 and 55 net words per minute; if he is superior, he should type at 60 or more net words per minute. An error limit that is neither too lenient nor too rigid should be used with a penalty of ten words off for each error used. The selective process can well operate again at the end of this semester, and only those students who can earn a certificate of proficiency or be conscientiously recommended to office employers and business teacher-training institutions should be permitted to continue with the fourth semester.

Fourth Semester. The fourth semester is really the most essential one, so far as the standards of attainment are concerned, for at the close of its work the student goes into the business world to succeed or fail. Therefore, this semester's work should aim to clear up any vague or uncertain points in the course, as well as step up the student's output ability. During this semester he must learn how to do the more difficult types of tabulation. He should develop a knowledge of legal and business forms that will not only cover their writing but also their meaning and use, if that has not been taught in other courses. His ability in controlled writing should be further improved and greater endurance developed, so that he can type all day in a business office without fatigue. In speed, he should develop the maximum of which he is capable. This should be at least 50 net words per minute, 55 to 65 for the average student, and 70 or more net words per minute for the superior or gifted students. An error limit should be used that is more rigid than for previous semesters, and 10 words should be penalized for each error in calculating speeds.

This semester should provide sufficient work under pressure to bring production speeds up to the standards required by the business office.

These production goals may be obtained as follows applying the 10 word penalty, take the average of three 5-minute, straight-copy tests on which errors have been carefully marked and net speed determined. This average copying rate may be used in setting production goals for other material. Experimental studies have set up the following relation ship between net copying rate and the typing under time of certain other kinds of material

	<i>Per Cent of Copying Speed</i>
Simple rough drafts	40
Business letters	75
Envelopes	50
Stencils	50
Simple tabulated reports	25-40
Simple manuscripts	60-75
Manuscripts with footnotes	40-50

This means that, if the student can type 40 net words per minute he should be able to type business letters at 30 net words per minute, while if his average net speed is 60, he should be able to type business letters at 45 net words per minute. This should prove to the student the need for developing the copying speed to as high a point as possible. When determining the production rate, the net speed should be used because the 10 word penalty assumes that a typist can type approximately 10 words in the time it takes to correct an error. Actually there is little proof that this assumption is correct for the rate is too low for most students and too high for others. When multiple carbons require erasing the figure is much too low.

With these requirements set up as the ultimate goal for each semester's work, there are certain daily and weekly requirements that, if used, will contribute much toward the attainment of the semester's requirement. In the first semester the teacher should set up some definite aim for the student each day. This gives the student a sense of responsibility and teaches him to use his time wisely, both of which will be a business asset to him later. In the other three semesters, the teacher may set up a definite amount of work for a longer period because the type of work during these semesters requires a broader perspective than that of the first semester. This plan will help to train the student to judge the use of his time.

The student should be required to do his best in all work, and he is

the first judge of this. The final judge is the teacher, who can require work to be rewritten. The student should not be required to rewrite a copy, however, unless he is going to learn something by doing so. Where it seems necessary to raise the quality of work, the teacher may place a limit upon the number of errors any piece of work may contain. Requiring absolutely accurate work creates tension, which makes errors, but tension is minimized, if not entirely removed, when the student is asked to do his best.

The word "perfect" has been overused. It may suggest force or compulsion and is often given too much emphasis by the teacher. The word "accurate" or "correct" may convey the same meaning and will not only relieve tension but give added meaning to the word "accuracy."

The required assignment work is not all important but is needed to teach the forms. It does little toward developing straight-copy skill. It should, whenever possible, emphasize independent thinking and require as little exact copying from the book as possible. Dependent copying is bad, because it is not practical and teaches very little. Give the student a problem whenever possible and thus teach him to think. This means the teacher must be expertly familiar with typewritten forms.

Grading Is a Process of Evaluating. Many methods of grading may be applied to typing work. It is especially adapted to objective grading. Yet, the end of each week finds many teachers questioning the validity of the grades they have assigned to the work handed in by their typing students, and the end of each quarter or semester finds many typing teachers questioning the fairness and the adequacy of their grading methods. It is easy to list factors that control the grade, such as method of checking the papers, point of emphasis used, quality of work expected, quantity of work required, time allowed for the work, condition of the equipment, and the leniency of the teacher, yet, in most cases but one or two factors may determine the grade given. The intentions are probably good, but teachers may be prone to follow the path of least resistance, that is, do it the easiest way.

A school mark, or grade, is an interpreted measure of achievement. It expresses a comparison of a measure of achievement with a norm, which is usually subjective. It exists only in the mind of the person who gives the mark and therefore different teachers use different norms. The same teacher likely uses different norms at different times. If the

student should be judged by another teacher who has in mind a different norm, the grade will be different. Failure to recognize this distinction between scores and school marks constitutes one of the limitations of testing or grading. A score is an absolute measure of achievement, but until it is compared with a norm, it has no meaning.

The words "grading" and "evaluation" are often used synonymously. Dr. Marion M. Lamb distinguishes them thus:

Evaluation is the rating of the student on all the objectives established for the typing course, which would, of course, include objectives related to the development of certain attitudes and personal qualities. Grading is used to denote the determination of the percentage or letter grade given to the student according to a definite and acceptable plan.¹

The grade in typing should be a fair, impersonal, objective evaluation of the achievement of the student for that grade period or piece of work, taking into consideration the fact that there are different levels of ability, because typing is a skill subject. The student of superior ability is not an A student just because of that ability, if he does not work to the extent of his ability. The poorest students cannot be graded only on the hours they have spent trying to keep up with the class average of achievement. Therefore, grading must be based on a working standard or norm of achievement that will include the varied abilities of the individuals of the class, if it is to be a fair and valid evaluation of what the student has achieved.

Grading must be done by a predetermined plan—never a haphazard procedure. Much of the grading work in typing is based on papers that are corrected and then graded. Typing papers are ordinarily graded for one or more of three fundamental reasons: (1) for administrative purposes, (2) for remedial purposes, and (3) for motivation purposes. Administrative purposes include such objectives as determining what progress a student is making, whether he passes or fails, whether he is eligible for rewards and honors, etc. Remedial purposes aim to determine the specific difficulties a student is having so that he may be corrected and guided toward the best possible progress. Motivation purposes aim to stimulate students to strive hard to learn to type.

How many papers need to be graded to satisfy any one of these

¹ Marion M. Lamb, *Your First Year of Teaching Typewriting*, South Western Publishing Company, page 103.

three purposes? If only one paper a week were graded for each student, 18 to 20 grades would be available at the end of the semester. Would an average of that many grades be enough to give a fair estimate of a student's attainment? If two papers a week were graded for each student, 36 to 40 grades would be available, and one paper a day would give 90 to 100 grades. How many papers or grades are really needed to give a valid mark? D. D. Lessenberry¹ recommends the "selected problem plan" in grading, that is, choosing for grading certain exercises and problems that sample the student's skill and job proficiency. He says drills represent new learning or drives toward new skill objectives and should be checked but not for grading purposes, they should be checked to reveal student progress and needs. He further recommends that two-thirds of the final grade for the grade period be based on the grades for the selected exercises referred to above, and one-third of the final grade be based on test results. James L. Mursell² advises teachers not to place faith in a single record but to scan a series of records before attempting to measure progress. Somewhere between these two opinions there must be found a way of handling papers that will conform to a sane conception of the function of the teacher and, at the same time, provide a close check on the productive ability of each student. Emphasis should be shifted from typing to establish a good grade to typing to achieve a particular objective.

To satisfy the remedial function, it is not necessary to grade every paper typed. Remedial work involves diagnosis of errors and the application of corrective measures. Errors are, generally speaking, either accidental or habitual. Not much can be done about the accidental errors, but the habitual ones need remedial work. Since habitual errors are likely to occur in almost every paper the student types, an analysis of almost any paper would reveal some of them, so every paper need not be graded to find them. It seems doubtful that every paper should be graded for motivation purposes, although students have been conditioned to believe that any paper handed in should be graded and returned. Students should be interested in knowing how well they have done, what progress they are making, but surely grades cannot be the

¹ D. D. Lessenberry and T. James Crawford, *Manual, 20th Century Typewriting* Fifth Edition, South Western Publishing Co., pages 58, 59.

² James L. Mursell, "Acquiring Consistency and Dependability," *Business Education World*, September, 1941.

only type of motivation used if teaching is to be effective. Other means of stimulation must be used.

Measurement in typing should supply the student with a measuring stick that will enable him to determine for himself the degree to which he has mastered the habits he has been engaged in establishing. The necessary knowledge, attitudes, and skills should be tested and evaluated by the most effective testing and grading devices. Few progressive teachers who have attempted seriously to apply systematic procedures and modern testing methods will question the statement that a competent teacher can determine the rank and individual grades of his students more efficiently by careful study from day to day of the students at work than he can by spending long hours administering formal tests, followed by more hours of formal checking and analysis of papers and extensive calculations to evaluate the test results. For years there has been a tremendous effort to develop objective tests and measurements that will provide more uniform evaluations of student performance than traditional teachers' grades, yet, after a vast amount of effort, there are many who still believe that teachers' grades are, after all, more dependable in many respects than the results of many of the objective tests. The student's work and his attitude toward it provide rather definite bases for determining grades objectively.

The typing teacher has standards to maintain that prevent the true application of the percentages of the normal frequency curve of distribution. Because of limited equipment, classes in typing are often too small to provide the number of cases needed for application of the frequency curve. Unless the teacher is forced to grade each class as a unit, sections may be combined for grading purposes. There are many variations in grading scales. Teachers are urged to weigh all suggestions and scales for grading and to rearrange or adapt them to meet their individual needs. The working standard cannot be perfected but must be arranged to include the abilities of the individual students. Such a standard means expecting every student to do his best, which will vary like the frequency curve.

Perhaps students have suffered more from naive attempts to judge their total achievement by judging their performance on some one factor like accuracy, than from any other cause. A grade on errors only does not reveal either the speed at which the paper was typed or the techniques by which it was written. Grading for accuracy alone actually retards the development of production speed and good techniques.

The student's grade should always reflect his total performance, if it is to be a measure of achievement and a guide to his probable future success in continuing courses or in the use of the knowledge and skill in later years

Grading Technique of Operation. To get a good grade, the student will be interested in the product (his paper), and not in the learning process (his technique of operation) Teachers are interested in the product, too, but they are more concerned about the process, for they know that the only effective road to skill is through the development of good techniques Students seem to be more concerned with attaining accuracy than with getting either speed or good technique, for they expect to be graded on accuracy If high production speed plus accuracy is to be achieved, good operating techniques must be developed Stressing production speed through grading is rare in typing classes, the grading of techniques is also rare, because teachers find it difficult to grade this quality objectively Giving grades for techniques is a somewhat subjective process, but it is worth while if only because it causes the student to try to improve those techniques and to arrive at a general impression of whether his are good, ordinary, or poor

The simplest method of grading technique is to make up such a grade at each grade period Although this grade will be averaged in with the grades on the other work, the student should know how he was rated Although it is a subjective grade, this does not mean that the grade is merely a snap judgment of the teacher It should be thoughtfully and intelligently arrived at A pattern may be used for this measurement—the best student in the class (if the class contains a sufficiently superior one), some fine typist he has known, or an ideal the teacher may have in mind

Many recommend the use of a technique check sheet and rating scale Since several are available, the teacher may use one of these or from them develop his own In using these, the student may check himself and then rate himself with the teacher as final judge of the grade It is recommended that each student be checked early in the beginning class and at stated intervals thereafter Through this process students become 'technique conscious' and will usually strive to improve Another value results from the fact that the teacher gives the student the chance to prove he is improving his technique This is extremely important during the first semester but has merit for the

other semesters also, only it need not be used so often, especially during the fourth semester. The teacher should try to supply the suggestions necessary for the correction of poor technique, or the whole grading plan loses its effect.

Grading the Assignment or Form Work. The function of the textbook material is to teach the typewritten forms. This learning involves the solution of problems that may require experimentation on the part of the learner, a checkup by the teacher on procedure and understandings, followed by practice by the student to fixate the right work habits and to establish a mastery of the right forms, and then testing to determine the extent of the learning that has taken place. Most of this form work falls in the second, third, and fourth semesters. The textbook material for the first semester is practice material and should be used as such. This should not be graded but should be corrected or critically inspected by the student and sometimes by the teacher for remedial purposes. The few simple forms taught should be presented near the end of this first semester.

In grading form work, it is customary to grade each exercise and strike an average for the grade on the lesson or unit or budget. This is far fairer than if the teacher tries to strike an estimate of what a unit of several exercises is worth. The plan of grading the exercises depends on the requirement, the requirement should, in turn, depend on the type of exercise. But grading each exercise involves a great deal of work. It would be simpler to total the errors on the group of exercises and grade the total. When classes are very large, the teacher may not have time to grade all the work, so a plan of sampling may be used. It should be remembered that a student has a right to know upon what basis his grade is determined, else he has no basis for improvement. Some students can do perfect work with good technique, but such work should not be expected at all. The use of the mailable copy idea and the production goal plan will discourage undue slowness of writing for perfect work.

First-Semester Grading. During the keyboard learning, the emphasis is upon the development of the technique of operation while the keyboard is being fixed. This is purely a practice procedure, and the only grading to be done is on the improvement in technique, attitude toward the work, co-operativeness, rhythm of stroking, etc. If the teacher feels he must grade some papers after the keyboard has been covered, some exercises may be graded during the continuity para-

graph-practice period that follows the keyboard work. Those to be graded may be selected by "sampling" or the assignment of an exercise once or twice a week, using the surprise element in choosing the day. Since the objective is practice, the students may be allowed to practice the exercise before it is written as an assignment; then but one copy should be permitted for the graded copy. The practice will tend to develop self-confidence for the graded work. Credit or grade should not be given for extra practice work. Indirectly, it improves the student's ability to do the next piece of graded work. Equal stress must be laid upon his ability to do a certain amount of a certain quality of work in a given time and at the same time that all other students are doing the assigned task.

Each student should be encouraged to write as many complete exercises as he can during the time devoted to the practice, striving to make each exercise better than the one before. This gives him the maximum amount of practice on the exercise. At the end of the time (which should not be too long), he checks his work and hands in what he considers to be his best copy. This teaches him to pass judgment upon his own efforts, trains him to check his errors, and forces him to evaluate his work. The following grading scale may be used for this one best copy. It will automatically, hence objectively, grade his work. The scale seems amply lenient; but if the teacher wishes to stress accuracy more, the adjustment should not be difficult. It should not be forgotten, however, that ease of operation is a major point of emphasis. Undue stress on accuracy will prevent this, especially at this early stage.

<i>Per Cent Method</i>		<i>Symbol Method</i>	
No errors	100	No errors	A
With 1 error	98	With 1 error	A—
With 2 errors	95	With 2 or 3 errors	B
With 3 errors	92	With 4 or 5 errors	B—
With 4 errors	90	With 6 or 7 errors	C
With 5 errors	88	With 8 or 9 errors	C—
With 6 errors	85	With 10 to 12 errors	D
With 7 errors	82	With 13 to 15 errors	D—
With 8 errors	80	With over 15 errors	F
With 9 errors	78		
With 10 errors	75		
With 11-15 errors	72		
With 16-20 errors	70		
With over 20 errors	68 or lower		

If the teacher has the time, it is more satisfactory to grade by the method of ranking and rating. This involves listing each set of papers with the best first and the poorest last, in a ranking order. Then rate them from A through F or with the progression of percentages. This method has several advantages, namely, it is more impersonal, the grade is permitted to fluctuate according to the work done, it is more motivating to the student, because he cannot tell just where he will be in the list of grades, and it affords an opportunity to keep a record of the results of each exercise, which is useful for study and comparison with future classes and permits grading the absent student on the same basis as the class.

For the form work exercises of the first semester, the single assignment plan is preferred, and the standard of work should be the best copy written after a reasonable number of attempts and a reasonable amount of time spent. Students should not be permitted to make too many attempts of their exercises in the effort to get a good copy. The grading plan for this work is the same as that suggested for the one best copy of the simpler exercises. Sometimes the point of emphasis in the work may affect the grading. The standard of excellence or basis for an A may fluctuate.

One important factor in grading is for teachers and students to realize that there are different levels of ability. Not all students are A students any more than it is true that some must be F students. Students should know that a grade is earned. It is not the gift of a patronizing teacher, but the honest effort of his teacher to evaluate his work and represents an appraisal of not one but several elements of work.

Often the superior student does not have enough work to keep him busy and alert, and so does not work to the extent of his ability. The poorer student has difficulty, or finds it impossible, to keep up with his class. The solution is to have a working standard to include this range of abilities. What should the superior student do after completing his graded copy? The teacher should make him feel that this is a real improvement opportunity and should suggest practice material to improve his operative skill. When he is kept busy by this plan the poorer student will be less embarrassed in completing his work. Every student is entitled to have a chance to employ his powers in the development of his skill. The student who is poor at the beginning of the course may be one of the better students at the end if he is only given a chance.

If uniform general methods are imposed on everyone alike, mediocrity will be encouraged for all.

Most teachers have their own "blueprints" for meeting the ideal distribution of grades. These grading plans may be original, or they may have been developed from books or from plans of other teachers. It is the desire of the author to present plans and ideas to help teachers formulate their own grading schemes. So many variations and local needs can enter into the development of grading methods that it is impossible to consider all of them or even set them down in printed form. It is not expected that the ideas expressed here will be used just as presented.

Each teacher can list factors that he feels are essential for grading typing work, but too often one or two of these factors determine the grade given. This is generally because the teacher lacks a predetermined plan for the grading. Before a piece of work is assigned or a test given, the teacher should decide what factors will be used in grading it and the student should know just what the assignment is intended to test in his work, else to him it may mean only something the teacher "cooked up" to keep him busy or to provide the basis on which to grade him.

A grade in typing must represent the student's achievement in skill development, not his achievement in winning the favor of the teacher, nor the intense effort he has made, nor his faithful attendance. The student's rating should be based on the technique of operation he develops, the quality of the work he produces, the speed with which he turns out this work, and the attitude he shows while doing it. After each graded effort, a student should compare his results with the best he has done on previous occasions, and sometimes he should compare them with that done by his fellow students. Students have a right to know upon what basis their grades are determined and that all other members of the class must take their grades from the same unit of measure. Yet, a grading scheme should not be expected to apply to class after class year after year. It may be necessary to adjust the grading plan to the present situation or class. This necessity should be refreshing to the teacher, and it may prove fairer to the student. Students are inclined to do their best work when they know their best efforts will receive honest consideration.

Every student should understand that a reasonable portion of each practice period is to be spent in general practice for which he may not receive a grade but which will have a marked influence on grades.

assigned later to other work because of the improvement of his skill. He should also understand that he will be required during each period to try to produce a finished piece of work within his capacity. The practice of allowing overtime for a better copy or in order to complete the assigned task encourages him to work less efficiently during the class hour. He could not do this in the business office.

Students should make it a practice to check their work, both practice and assignment. The teacher must recheck *at least* one production job or budget a week for each student after the first week or two beyond the first semester in order to establish a concrete basis for grading the student's daily performance in this particular. Most teachers do more rechecking than this to obtain what they believe is a better picture of the student's work. If the teacher has the time, this can be commended so long as he does not go to the extreme that makes the student feel the teacher is his proofreader and his own checking is not really necessary because the teacher will find the errors anyway.

Most of what a student does in typing should receive some consideration, but that does not necessarily mean a grade. If only one paper is checked and graded each week, all other papers completed during the week may be recorded as either having been handed in or not. Each assignment checked should receive a greater valuation than those recorded only. The announcement of the assignment selected for checking and grade should not be made until after all papers have been handed in. Since all papers are considered and given credit in some way by this plan, consistency of performance is checked and a more stable situation is created, for it eliminates the "guessing game" entered into when students know that only one assignment is to be considered.

Grading the Timed Tests. Many grading plans for the introductory work are essentially sheer guesswork, arbitrary, or misleading. No single factor, such as total lines typed, total errors, total correct lines typed, or the number of errors, reflects truthfully what the student has accomplished. The important factors are the student's achievement with respect to posture, keyboard learning, and operation techniques. These may be judged best through daily observation. Here, where the objectives are solely introduction to the typewriter, manipulative operations, posture, basic techniques, the development of a worthwhile practice routine, and desirable work habits, it is possible for the teacher to make day-to-day evaluations of student performance. The nature of daily achievements in typing is such that they are reflected

continuously. This makes daily grading unnecessary and extremely wasteful of time and effort, but daily evaluation in the mind of the teacher is important and necessary. Thus, he can accumulate material upon which to base definite grades for grading periods of any desired length.

Timed writing begins soon after the keyboard is presented, with short timings that are intended to get the student accustomed to writing when time counts. These may begin as half-minute efforts and should not be called tests or even considered as such. They should not be graded as individual tests, else the pressure of the grade will prevent the best results. They are a device to develop controlled writing and encourage faster stroking. Their objective is improvement in these two respects, and the only part grading could have would be to select the best gross speed made, for the half-minute timings over a period of no less than a week, the minute timings, etc., and grade that by ranking and rating. If controlled writing is to be graded, it would have to be based on errors made only. Later in this first semester, three things may be considered in grading these practice timings: (1) the student's best speed with no errors; (2) the student's best speed with not more than one error per minute; and (3) the total improvement from his first test to his best test for 1 minute, for 2 minutes, etc., for all the short timed writings. After the first semester, short timed writings should be considered practice for improvement of skill measured by the long timed tests and so need not be graded. Motivation devices, other than grades, should stimulate the student's efforts to improve.

Accuracy tests were once popular. This was during the time that accuracy was of major emphasis. The evils of that practice are known. Speed and accuracy must be kept in balance; so there are times in the course when accuracy or controlled writing must be emphasized. For these timings, simple grading scales may be used, should the teacher wish to grade the efforts. The following scales are suggested:

HALF-MINUTE ACCURACY TESTS

Errors	Grade
0	A, or 100%
1	B, or 90%
2	C, or 80%
3	D, or 70%
4	F, or 60%
5 or more	F, or 50%
	40, etc.

ONE-MINUTE ACCURACY TESTS

Errors	Grade
0	A, or 100%
1	B, or 92%
2	C, or 85%
3	D, or 78%
4	F, or 70%
5	F, or 62%
6 or more	F, or 55%
	48, 40, etc.

TWO-MINUTE ACCURACY TESTS

Errors	Grade
0	A, or 100%
1	B, or 94%
2	C, or 88%
3	C-, or 82%
4	D, or 76%
5 or more	F, or 70%
	64, 58, 52, etc.

THREE MINUTE ACCURACY TESTS

Errors	Grade
0	A, or 100%
1	B, or 95%
2	B-, or 90%
3	C, or 85%
4	C-, or 80%
5	D, or 75%
6 or more	F, or 70%
	65, 60, 55, etc.

FOUR MINUTE ACCURACY TESTS

Errors	Grade
0	A, or 100%
1	B, or 96%
2	B-, or 92%
3	C, or 88%
4	C-, or 84%
5	D, or 80%
6	D-, or 76%
7 or more	F, or 72%
	68, 64, 60, etc.

FIVE MINUTE ACCURACY TESTS

Errors	Grade
0	A, or 100%
1	A-, or 97%
2	B, or 94%
3	B-, or 91%
4	C, or 87%
5	C-, or 83%
6	D, or 79%
7	D-, or 76%
8 or more	F, or 72%
	69, 65, 61 57, 53, 49, 46 etc.

These short tests may be helpful during the second half of the first semester and during the more advanced semesters, when the grade may be used only as an appraisal device and not as a recorded grade.

A newer plan for emphasizing accuracy in timed writing is to calculate the errors made per minute by dividing the total errors by the time of writing. This provides a better means of evaluating and comparing tests in respect to their accuracy than that of total errors. For example, 5 errors made on a 5-minute test means 1.0 error per minute, but 5 errors on a 10-minute test means 0.5 error per minute. As a general rule, no grade credit should be given for any timed work containing more than 2 errors per minute in the first semester, 1.5 errors per minute in the second semester, 1.0 error per minute in the third semester, and 0.5 error per minute in the fourth semester. Grades need not be based on these errors per minute figures, but they are most helpful in comparing the accuracy of timed tests. The above standards may be used as objectives for practice tests, but most teachers and students would think them too rigid or high for grading requirements. If a grade

A careful inspection of the speeds will show why the B group has only 15 per cent and the C group has only 40 per cent. The mark A is more flexible than 100 per cent, and yet it should not be used except on superior tests. To get A, a student should write at least 15 words above the basic speed at the beginning of the semester and 20 or more words later in the semester. There need not be an F if all the students exceed the required basic speed.

But scales or tables are best for speed grading because they are adaptable to the conditions and requirements of the class. The very simplest scale for speed grading is illustrated below:

SPEED SCALES SECOND SEMESTER

First Half (Basic speed, 15 words)		Second Half (Basic speed, 20 words)	
Net Speed	Grade	Net Speed	Grade
Over 30	A, or 98%	Over 35	A, or 98%
25-29	B, or 93%	30-34	B, or 93%
20-24	C, or 86%	25-29	C, or 86%
15-19	D, or 78%	20-24	D, or 78%
Below 15	F, or 72%	Below 20	F, or 72%

THIRD SEMESTER (Basic speed, 30)		FOURTH SEMESTER (Basic speed, 40)	
Net Speed	Grade	Net Speed	Grade
Over 45	A, or 98%	Over 55	A, or 98%
40-44	B, or 93%	50-54	B, or 93%
35-39	C, or 86%	45-49	C, or 86%
30-34	D, or 78%	40-44	D, or 78%
Below 30	F, or 72%	Below 40	F, or 72%

In using the above tables for the percentage method, the grade for speeds below the basic speed may be scaled below 72 per cent according to the speed made.

The scale or table method of grading may be made more complex to assign a more exact grade, and may be made to include the accuracy of writing. These complex tables may be started with a small range at the beginning of the semester and, as the class improves in speed, they may be built up to take care of the speed growth. Because of this possibility of adjustment to the ability of the class, these scales are fair and eliminate the personal element in the grading.

When accuracy is included in the grade, there is not always full

agreement on the error limit. They are usually based on the time of writing, thus, for a 5 minute test, 5 errors are allowed, for a 10-minute test that stresses accuracy, 5 errors would be allowed, but 8 errors seems better for speed encouragement, and for a 15-minute test, 10 errors is the rigid allowance, and 12 errors causes less pressure.

The following tables illustrate the application of the symbol method to this type of grading and include accuracy in accordance with the above error limits.

SPEED WITH ACCURACY SCALES

SECOND SEMESTER

First Half (5 minute tests)			Second Half (10 minute tests)		
Net Speed	Errors	Grade	Net Speed	Errors	Grade
30 or over	5 or less	A	35 or over	8 or less	A
30 or over	Over 5	A-	35 or over	Over 8	A-
25-29	5 or less	B	30-34	8 or less	B
25-29	Over 5	B-	30-34	Over 8	B-
20-24	5 or less	C	25-29	8 or less	C
20-24	Over 5	C-	25-29	Over 8	C-
15-19	5 or less	D	20-24	8 or less	D
15-19	Over 5	D-	20-24	Over 8	D-
Below 15		F	Below 20		F

Should the 35 and over group be too low, the second half of the semester in a class with several superior students vying for A grades, the C group of 25-29 could be enlarged 5 words and the scale extended up so the top would be 40 and over. If that is not high enough, then the B group could also be enlarged to make the A group 45 and over. The scales that follow could likewise be extended should the need arise.

SPEED WITH ACCURACY SCALES

THIRD SEMESTER

First Half (10-minute Tests)			Second Half (15 minute Tests)		
Net Speed	Errors	Grade	Net Speed	Errors	Grade
50 or over	8 or less	A	55 or over	12 or less	A
50 or over	Over 8	A-	55 or over	Over 12	A-
45-49	8 or less	B	48-54	12 or less	B
45-49	Over 8	B-	48-54	Over 12	B-
35-44	8 or less	C	38-47	12 or less	C
35-44	Over 8	C-	38-47	Over 12	C-
30-34	8 or less	D	30-37	12 or less	D
30-34	Over 8	D-	30-37	Over 12	D-
Below 30		F	Below 30		F

FOURTH SEMESTER (15-minute Tests)		
<i>Net Speed</i>	<i>Errors</i>	<i>Grade</i>
65 or over	12 or less	A
65 or over	Over 12 ..	A—
57-64	12 or less	B
57-64	Over 12	B—
47-56	12 or less	C
47-56	Over 12	C—
40-46	12 or less	D
40-46	Over 12	D—
Below 40		F

The fourth-semester table can be set up in two parts like those for the second and third semesters, it may be expanded if 65 is not high enough, or it may be reduced below 65. These scales should be made high enough to keep the students working, but not so ambitious as to discourage them.

Similar tables or scales may be constructed for the percentage method of grading and can be so made as to give an exact grade. Such tables for the second, third, and fourth semesters appear on page 364. There is one for each semester; but if more are needed, the teacher can construct them.

Speeds below zero should never be calculated. The grade allowed by the table for a zero speed really gives the student something for his effort. The percentage tables give a wider spread to the grades. To show how these three percentage tables operate, the last, or fourth-semester, table will be used. For example, if a student writes with a net speed of 62 words per minute and makes 5 errors, his grade would be 97 per cent, while the grade of a student writing 54 words per minute with 5 errors would be 89 per cent. If these two students had made 15 and 18 errors, respectively, their grades would have been 92 and 84 per cent, respectively. Thus, an exact grade is obtained.

Some teachers like to make accuracy count as much as speed when grading speed tests. While the author does not agree with that point of view, such a grading plan is here proposed. Omit the Errors column and each alternate item in the three tables just given. Using the illustrations given above, the plan operates thus. If the test of 62 words per minute were perfect, the grade would be 97 per cent, but with 5 errors, the grade is 92 per cent. That means as many points are deducted as there are errors made. A speed of 54 without error would grade 89 per cent, and with 5 errors it would be 84 per cent, or with 18 errors it would be

agreement on the error limit. They are usually based on the time of writing: thus, for a 5-minute test, 5 errors are allowed, for a 10-minute test that stresses accuracy, 5 errors would be allowed, but 8 errors seems better for speed encouragement, and for a 15-minute test, 10 errors is the rigid allowance, and 12 errors causes less pressure.

The following tables illustrate the application of the symbol method to this type of grading and include accuracy in accordance with the above error limits.

SPEED WITH ACCURACY SCALES

SECOND SEMESTER

First Half (5 minute tests)			Second Half (10 minute tests)		
<i>Net Speed</i>	<i>Errors</i>	<i>Grade</i>	<i>Net Speed</i>	<i>Errors</i>	<i>Grade</i>
30 or over	5 or less	A	35 or over	8 or less	A
30 or over	Over 5	A-	35 or over	Over 8	A-
25-29	5 or less	B	30-34	8 or less	B
25-29	Over 5	B-	30-34	Over 8	B-
20-24	5 or less	C	25-29	8 or less	C
20-24	Over 5	C-	25-29	Over 8	C-
15-19	5 or less	D	20-24	8 or less	D
15-19	Over 5	D-	20-24	Over 8	D-
Below 15		F	Below 20		F

Should the 35 and over group be too low, the second half of the semester in a class with several superior students vying for A grades, the C group of 25-29 could be enlarged 5 words and the scale extended up so the top would be 40 and over. If that is not high enough, then the B group could also be enlarged to make the A group 45 and over. The scales that follow could likewise be extended should the need arise.

SPEED WITH ACCURACY SCALES

THIRD SEMESTER

First Half (10 minute Tests)			Second Half (15 minute Tests)		
<i>Net Speed</i>	<i>Errors</i>	<i>Grade</i>	<i>Net Speed</i>	<i>Errors</i>	<i>Grade</i>
50 or over	8 or less	A	55 or over	12 or less	A
50 or over	Over 8	A-	55 or over	Over 12	A-
45-49	8 or less	B	48-54	12 or less	B
45-49	Over 8	B-	48-54	Over 12	B-
35-44	8 or less	C	38-47	12 or less	C
35-44	Over 8	C-	38-47	Over 12	C-
30-34	8 or less	D	30-37	12 or less	D
30-34	Over 8	D-	30-37	Over 12	D-
Below 30		F	Below 30		F

FOURTH SEMESTER (15-minute Tests)		
<i>Net Speed</i>	<i>Errors</i>	<i>Grade</i>
65 or over	12 or less	A
65 or over	Over 12	A-
57-64	12 or less	B
57-64	Over 12	B-
47-56	12 or less	C
47-56	Over 12	C-
40-46	12 or less	D
40-46	Over 12	D-
Below 40		F

The fourth-semester table can be set up in two parts like those for the second and third semesters, it may be expanded if 65 is not high enough, or it may be reduced below 65. These scales should be made high enough to keep the students working, but not so ambitious as to discourage them.

Similar tables or scales may be constructed for the percentage method of grading and can be so made as to give an exact grade. Such tables for the second, third, and fourth semesters appear on page 364. There is one for each semester, but if more are needed, the teacher can construct them.

Speeds below zero should never be calculated. The grade allowed by the table for a zero speed really gives the student something for his effort. The percentage tables give a wider spread to the grades. To show how these three percentage tables operate, the last, or fourth semester, table will be used. For example, if a student writes with a net speed of 62 words per minute and makes 5 errors, his grade would be 97 per cent, while the grade of a student writing 54 words per minute with 5 errors would be 89 per cent. If these two students had made 15 and 18 errors, respectively, their grades would have been 92 and 84 per cent, respectively. Thus, an exact grade is obtained.

Some teachers like to make accuracy count as much as speed when grading speed tests. While the author does not agree with that point of view, such a grading plan is here proposed. Omit the Errors column and each alternate item in the three tables just given. Using the illustrations given above, the plan operates thus. If the test of 62 words per minute were perfect, the grade would be 97 per cent, but with 5 errors, the grade is 92 per cent. That means as many points are deducted as there are errors made. A speed of 54 without error would grade 89 per cent, and with 5 errors it would be 84 per cent, or with 18 errors it would be

PERCENTAGE METHOD OF GRADING

SECOND SEMESTER

First Half

(Basic speed, 15; passing grade, 75%; 5-minute tests)

Net Speed	Errors	Grade	Net Speed	Errors	Grade
Over 28	5 or less	96-100	18-20	5 or less	76-80
Over 36	Over 5	91- 95	18-20	Over 5	71-75
31-35	5 or less	91- 95	11-15	5 or less	71-75
31-35	Over 5	86- 90	11-15	Over 5	66-70
26-30	5 or less	86- 90	6-10	5 or less	66-70
26-30	Over 5	81- 85	6-10	Over 5	61-65
21-25	5 or less	81- 85	0- 5	5 or less	61-65
21-25	Over 5	76- 80	0- 5	Over 5	56-60

THIRD SEMESTER

(Basic speed, 30; passing grade, 75%; 10-minute tests)

Net Speed	Errors	Grade	Net Speed	Errors	Grade
Over 51	8 or less	96-100	26-30	Over 8	66-70
Over 51	Over 8	91- 95	21-25	8 or less	66-70
46-50	8 or less	91- 95	21-25	Over 8	61-65
46-50	Over 8	86- 90	16-20	8 or less	61-65
41-45	8 or less	86- 90	16-20	Over 8	56-60
41-45	Over 8	81- 85	11-15	8 or less	56-60
36-40	8 or less	81- 85	11-15	Over 8	51-55
36-40	Over 8	76- 80	6-10	8 or less	51-55
31-35	8 or less	76- 80	6-10	Over 8	46-50
31-35	Over 8	71- 75	0- 5	8 or less	46-50
26-30	8 or less	71- 75	0- 5	Over 8	41-45

FOURTH SEMESTER

(Basic speed, 40; passing grade 75%; 15-minute tests)

Net Speed	Errors	Grade	Net Speed	Errors	Grade
Over 61	12 or less	96-100	31-35	Over 12	61-65
Over 61	Over 12	91- 95	26-30	12 or less	61-65
56-60	12 or less	91- 95	26-30	Over 12	56-60
56-60	Over 12	86- 90	21-25	12 or less	56-60
51-55	12 or less	86- 90	21-25	Over 12	51-55
51-55	Over 12	81- 85	16-20	12 or less	51-55
46-50	12 or less	81- 85	16-20	Over 12	46-50
46-50	Over 12	76- 80	11-15	12 or less	46-50
41-45	12 or less	76- 80	11-15	Over 12	41-45
41-45	Over 12	71- 75	6-10	12 or less	41-45
36-40	12 or less	71- 75	6-10	Over 12	36-40
36-40	Over 12	66- 70	0- 5	12 or less	36-40
31-35	12 or less	66- 70	0- 5	Over 12	31-35

71 per cent. A variation of this plan is to use an error limit, like 10 or 12, for 15-minute tests and to subtract 1 point from the grade determined by the table for each error over the limit. That is, if the error limit of 12 is used for a 15-minute test, drop the grade 1 point for 13 errors, 2 points for 14 errors, etc. This kind of grading scheme cannot be used for the symbol method of grading.

Typing classes often contain students who will "play along" during the semester, fully expecting to meet the speed requirement at the end. If they must make the speed only once, there is the feeling that there is plenty of time. The next grading scheme sets up a different scale for each six-week period of the semester, which provides a goal for the students to attain by the end of each grade period. Should reports or grades be issued only at nine-week periods, the plan could still be used just as it is. It gives more rigid grading than the other plans, for the students must meet their minimum speed requirement for the semester during the last six weeks or receive failing marks. An error limit may or may not be used. With the symbol method, it would give the test a minus grade if the errors exceeded the limit. With the percentage method, the grade could be reduced as many points as the error exceeded the limit.

Symbol	1st 6 weeks	SECOND SEMESTER		Percentage
		2d 6 weeks	3d 6 weeks	
A	35 and over	40 and over	45 and over	95 and up
B	30-34	35-39	40-44	90-94
C	25-29	30-34	35-39	85-89
D	20-24	25-29	30-34	80-84
F	Below 20	Below 25	Below 30	79 and down

Symbol	1st 6 weeks	THIRD SEMESTER		Percentage
		2d 6 weeks	3d 6 weeks	
A	45 and over	50 and over	55 and over	95 and up
B	40-44	45-49	50-54	90-94
C	35-39	40-44	45-49	85-89
D	30-34	35-39	40-44	80-84
F	Below 30	Below 35	Below 40	79 and down

Symbol	1st 6 weeks	FOURTH SEMESTER		Percentage
		2d 6 weeks	3d 6 weeks	
A	55 and over	60 and over	65 and over	95 and up
B	50-54	55-59	60-64	90-94
C	45-49	50-54	55-59	85-89
D	40-44	45-49	50-54	80-84
F	Below 40	Below 45	Below 50	79 and down

Using a scale is the easiest way to grade timed tests, yet it is impossible to set up any kind of norm or to construct any grading scale for general use. All educational authorities recommend that teachers should use class charts to show the progress of each student and should establish their own rankings and grading scales. But any grading scale that might be published will be attacked by some as too low and by others as too high.

Students should be taught to measure and evaluate their own work for their own satisfaction and because of the spur of their own interest. Therefore, the grading scale should not be kept secret by the teacher. It should be simple enough for the student to understand and accept without argument. He should know how it measures his effort.

Many grading scales have been developed differing from each other and from those presented here. The teacher should study them and construct his own to fit his needs. Above all, such scales should be not only adaptable but adjustable, so that they may serve different classes. Some of the best grading scales published are given in the footnote ¹.

It is quite generally accepted that typing competence cannot be measured by a single measuring instrument, such as the timed test. While straight-copy typing has its place in a measurement program, it is of decreasing importance as the student grows in skill to type office material. Neither can a student's one best test be used to measure his speed competency. The grade for timed writings should be based on control and speed. To do this fairly, there is a growing tendency to base the grade on the average errors and the average speed of the three best tests written during the grade period. The three tables given below illustrate how these may be constructed for 5-, 10-, and 15-minute timings. They may be made for *GWPM* (no penalty), or *CWPM* (1-word penalty), or *NWPM* (10-word penalty). It will be noted that these are based on the basic speeds—30, 40, and 50—and with error limits of 5, 10, and 12.

¹ A. B. Baxter, "Let the Student Win," *Balance Sheet*, January, 1936.

Lawrence A. Jenkins, "A Typewriting Grading Scale," *Business Education World*, November, 1936, pages 178-181.

Harold H. Smith, "A New Timed Test Chart," *Business Education World*, March, 1935, pages 545-546, also *Gregg Typing Manual*, page 112.

Howard Z. Stewart, "Grading Scale for Typewriting," *Business Education World*, beginning with September, 1939.

I. Average of three best 5-minute writings

	A	B	C	D	F
Errors	0	1-2	3-4	5	6-more
NWPM	50-more	45-49	35-44	30-34	0-29

II Average of three best 10-minute writings

	A	B	C	D	F
Errors	0-1	2-4	5-7	8-9	10-more
NWPM	60-more	55-59	46-54	40-45	0-39

III. Average of three best 15-minute writings

	A	B	C	D	F
Errors	0-2	3-5	6-9	10-12	13-more
NWPM	70-more	65-69	56-64	50-55	0-49

Similar tables may be used for the various kinds of production typing. The American Business Education Yearbook for 1950 has an article by D. D. Lessenberry, "Measuring Competence of Students Preparing for Typing Positions," which includes a number of such tables.

As with the grading of the form work, some teachers believe a point scale is the best plan for grading the timed tests. A variety of plans have been developed by teachers, but the usual one operates as follows: Determine the worth of a speed test in points by subtracting the number of errors made from the net rate per minute. In this way accuracy is considered twice—once in the figuring of the net rate, and once in the deduction for the points. But the method is shorter than the ordinary one of working out the percentage of accuracy, and the relative value is the same. For example, a test of 38 words per minute net, if without error, is worth 38 points, while a test with 38 net words per minute with 4 errors is worth only 34 points (38-4, or 34). Schools using this point system of grading arrange their own scale values for the points. The footnote references provide further help to those interested.¹

Measuring Improvement. It is important to determine how much stimulation students of typing can stand to make the learning proceed at the most economical and rapid rate. Though no way of measuring

¹ Jane E. Clem, *The Technique of Teaching Typewriting*, First Edition. The Gregg Publishing Company, page 333.

Norman J. Lawrence, *Combination Accuracy and Speed Point System of Grading, Typewriting News*. South Western Publishing Co., Spring, 1941.

C. C. Callarman, "A Weighted Grading Scale for High School Class in First Year Typewriting," *Balance Sheet*, January, 1946.

this important factor for individual learners now exists, all teachers should give careful attention to this point because of its direct practical effect on the student's advancement. This is a present-day problem in typewriting.

When a teacher can measure the actual gains that are made in each of the important sources of improvement and knows how much practice he should require to obtain the best results for originating and fixing the specific habits to be established, the work of directing students of typing will have been placed on a real scientific basis. Without such facts and their proper use by the teacher, the business of directing students of typing must continue to be largely a matter of trial and error, yielding some success, but much failure and waste.

Individual record sheets, now generally used, should be extended and revised so as to include the more important factors that can actually be measured and for making an estimate or rating by the teacher on such important factors as interest in the work, attitude towards success, interest in improvement, etc., because these not only contribute to the student's progress in learning to type but will encourage the habit of looking more for the exact sources of gain in learning and so will help to bring it about. When they see exactly what must be done to succeed, only one problem remains for them to solve, namely, to find the best way of doing these necessary things. This cannot be found if the teacher and student are uncertain about what they must really do to bring about the desired success.

To determine by actual measurement the amount of improvement that is being made also enables a teacher to interest his students in their own advancement. Even though no measurable gain is being made in his actual writing rate, a typing student may be making important progress if he is interested in his advancement. The gains made in all sources of improvement should be as accurately measured as one's total achievement in the subject, because each one of these factors contributes to the student's success in acquiring his skill. Since his progress does not always contribute a measurable amount to his performance score, its importance is often overlooked by both teacher and student, but each is an important element in producing the improvement that the student is making. It is, therefore, important that the method of measurement should indicate as far as possible the exact amount of improvement that a student is making in each of his sources of gain.

Such measurements are, of course, difficult to make for any instance

of learning, because some sources of gain are difficult to measure and because it is always troublesome to make a complete analysis of the student's task. This must be done in order to ascertain just what the student must do to succeed. Dr. William F. Book made an appeal for a learning test that would reveal to both teacher and student the exact kind and amount of advancement that were being made.¹ He believed that such a test would show that real advancement in learning is often made when there is no appreciable gain in writing score, because at such periods in the practice a student might be overcoming a certain tendency to make mistakes in his writing, or he might be gaining a clearer recognition of what he must do to make further advancement more rapid or sure, or he might be improving his attitude toward his success, towards the task of learning taken as a whole, or becoming more genuinely interested in his own advancement.

The mere knowledge of one's success is often sufficient to arouse an interest in one's improvement, while the absence of such information is largely responsible for the failure of learners to continue to advance after the elements of a subject have been learned. The use of a method of measurement should show exactly what must be done to increase one's skill. To see that one is making improvement in one or more respects stimulates him to greater effort, and this is needed to invent new and better methods of work. It also would sharpen the learner's vision and powers of judgment, so that any change in the desired direction or any response that increases his success will be noticed and more readily selected in his future practice, while every wrong response and the less economical methods of control that he has been using will be more promptly eliminated.

Many teachers have for some time tried to give their students credit for the improvement they have made through various methods. Sometimes the final grade was raised a point or two, sometimes the credit was given only by a commendatory remark, and sometimes it was delayed until the end of the course and a recommendation for a job was needed. Recently, a few teachers have been experimenting with ideas to discover a plan that would objectively measure the improvement in speed. These were usually based on the increase made in the words per minute. The difficulty lies, of course, in determining just what that increase should be.

¹ William F. Book "How Progress in Learning to Typewrite Should Be Measured and Why," *Business Education World*, October, 1934

In many phases of the work in typing, students may be given credit for making improvement. The student who can produce quality work on his first attempt should receive more credit than the student who must make additional attempts. Likewise, the student who at first requires several attempts but who produces a mailable paper in his first effort needs credit for such an improvement. Teachers must find the fairest way to grant this credit.

Making Up the Semester Grades The semester grade should always reflect the student's total performance, if it is to be a measure of his achievement and a guide to determining his probable future success in continuing the course or in predicting his use of the skill later. Grades should reveal to what extent objectives have been attained. Where the objective is solely an introduction to the typewriter, manipulative operations, basic techniques, and the development of a worth while practice routine, it is possible for the teacher to make day to-day evaluations of student performance in the first few weeks of the first semester. From these he can accumulate material upon which to base definite grades for use at the end of the first grade period. The difficulty for many teachers lies in putting together these grades, so that one grade will represent the student's entire effort for the period.

Semester grades, as well as grades for six or nine weeks, should be a composite of the several factors emphasized during that grade period with the factors weighted according to the strength of their emphasis. For example, technique should count heavily during the first semester, especially the first grade period. Attitude and desirable work habits could also prove important in making up these early grades. The most important factors are the student's achievements with respect to posture, keyboard control, and nonkeyboard techniques, for attitudes and work habits can be corrected later. It would seem feasible that posture and techniques should determine at least 50 per cent of the grade in the grade periods of the first semester and that the quantity and quality of the typed result be measured for the large part of the remaining 50 per cent of the grade. Near the end of the semester the teacher will have several sources for proof of the student's achievement in terms of speed and accuracy that may be a part of the grade for the last grade period.

During the second semester there are more factors to be included in the grade. A caution here is not to make the form work too large a part of the grade. It is important, but no more than 50 per cent important.

Timed-writing practice and timed tests for record are also extremely important. By this time the student's attitude toward his work and his co-operation in it may be given some weight (say 10 per cent each) in his grade. Even the student's interest in his progress and his ability to help himself might be considered in his grade.

All the major elements of basic and applied typing skill found in the second semester enter into the work of the third semester. The differences consist mainly in the addition of many minor elements, variations in style with which every vocational typist should be acquainted, work of greater difficulty and length, and higher standards for both basic and applied skills. The teacher should not grade on the quantity and quality of this work, but on the student's grasp and understanding of it all. He should try to determine the ability of the student to exercise common sense and initiative in doing this work. Neither should the teacher grade on the basis of speed and accuracy alone, but some influence of the improvement the student has made should be shown in the timed-writing grade.

The student should reach as high a job production standard as his ability will permit if he expects to be highly recommended for an office job. During this fourth semester, considerable work under test conditions and pressure of time should be done, and this should play an important part in the budget grade unless it is considered as a definite percentage of the composite grade for the period. Should a final examination be given at the end of the fourth semester to provide a basis for awarding a certificate of proficiency, it should not only test the student's ability to write rapidly with a high degree of accuracy, but it should prove his ability to type and correct errors by neat erasures at better than average speed. It should test his ability to solve problems of arrangement and placement and to type intelligently the papers he prepares. He should be required to attach and deliver to his teacher, properly assembled, all papers he handles. Hence, the grades given during the fourth semester should show the competency of the student to perform successfully the work required in a business office. This measures the student vocationally.

In making up the grade for any grade period of any semester the grade on the different types of work should be averaged. The amount of emphasis given to each should determine the weight assigned. For example, if it be early in the semester, the greatest emphasis may have been on form work, so that would make up 50 per cent of the grade.

The timed tests for speed, for any work stressing accuracy, for attitude, co-operation, work habits, etc., could be weighted 30 per cent, 10 per cent, and 10 per cent, respectively, or 20 per cent, 20 per cent, and 10 per cent, respectively, all depending on the emphasis placed on each. Later in the semester, the weighting might change like this: speed, 40 per cent, budgets, 25 per cent, job production ability, 25 per cent, and personal traits, 10 per cent. In making up the final grade for a semester, the improvement in speed, or the number of times the speed requirement has been made, or a grade based on the best speed made on a long timed test during the semester could be averaged with the two nine week grades to count one third of the semester grade. In schools where a final examination grade is needed to average with the two nine week grades, some teachers use a grade for any one of the three factors just mentioned, or a composite grade of two or all three of them. Final examinations are not recommended for typing, and the above plan seems to provide a fair substitute that is apt to meet with the approval of the school administrator.

To Summarize. Grading has many individual aspects that each teacher must handle for himself. Grading is measurement and should have guidance value. It is important for each student to know why he has earned a particular grade, and the teacher must be able to explain this to him without argument but with satisfaction. Exact standards are necessary, but a grading scale that gives too high a proportion of honor grades should be adjusted by raising the requirements for A or B. Likewise, a grading scale that gives too many low or failing marks should be adjusted to correct it. It really makes little difference what scale is used so long as it definitely gives each student full recognition for the work done and serves as a stimulating device for further improvement.

Grading is a type of measurement that must parallel teaching. Teaching cannot rise higher than the level of the teacher's skill and the student's ability to learn. The students' achievement should be a challenge to the teacher. Results should guide the teacher in planning the emphasis to be given in subsequent lessons as much as the student in his practice. When results are studied without prejudice or an attempt to "place the blame," excellent guidance will be gained. Daily observation of the students as they work can give real guidance for both teaching and grading. Teach for growth in desirable work habits, for consistency in the day-by-day performance, and the quantity and quality of typing.

will be satisfactory and measurement will be less difficult and burden some

CLASS DISCUSSION QUESTIONS

1. For what purposes are grades used? How important is grading? What should the typing grade represent?
2. What things make it difficult for teachers of typewriting to assign grades that are accurate and fair?
3. Compare the usual attitude of the following toward grades given in school student, teacher, principal, and parent
4. What are some of the most serious problems in grading? How best can they be solved?
5. How flexible may a grade of A be in speed in accuracy, or in form work? How flexible may a grade of 100 per cent be in these three?
6. Can you justify including personal traits in typing grades?
7. Distinguish between evaluating, measuring and grading
8. What are some of the forms in typing for which office requirements are difficult to determine? Name the different kinds of improvement in type writing for which a measuring device is needed
9. Why are standards in typing difficult to set up? Of what value are standards in typing? Of what value are job standards?
10. What is meant by standards of achievement? Who should decide what standards are to be used? Will the same standards fit all classes and schools?
11. What is meant by weighting grades? Of what advantage is it? How should the weights for each factor be determined?
12. If form work, speed work, and attitude toward the work are to be used in determining the grade of the second semester, what weight should each have in the grade? What weight should each have in the third semester?
13. Should form errors sometimes have a greater weight than the ordinary typing error when an exercise is being graded? Why should form and arrangement not be used in determining the grade during the keyboard work?
14. Is it a good plan to use the number of perfect copies written as the only basis of grade for the first semester work?
15. Why should the student check all papers before handing them in? What are the arguments for and against the practice of having the teacher correct and grade all papers handed in?
16. How may the strict application of the frequency curve to the speed work of a typing class be detrimental to speed progress?
17. Why may it sometimes be necessary to change the grading scale for speed work during a semester?
18. What is the effect of making accuracy count in the grade of a speed test?

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